

SEARCH DEPT

American Aviation

MANAGEMENT
ENGINEERING
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OPERATIONS
MAINTENANCE
EQUIPMENT

V. 17 No 15

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DEC. 21



Edgar Schmued
VP-Engineering
Northrop 22

New USAF Traffic
Control System 13



Titanium Shortage
Seen Critical 17



Military Neglecting
Air Freight 19



Don't Sell the
Turboprop Short .. 30





This is all you need to install AVIEN'S TWO-UNIT FUEL GAGE

You need no field calibration, no complicated data, and no "experts" to install this simplified system.

When it's time to install Avien's Two-Unit Fuel Gage, all you will require are simple tools.

You won't need calibration instruments, complex field data, or specially trained personnel. The Avien gage will have been precalibrated for your aircraft, so installation becomes as simple as "plug-in, plug-out."

This quick and easy installation avoids costly, time-consuming calibration on the flight-line.

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This ease of installation is just one of the factors which have made Avien's Two-Unit Gage the most talked-about system in the industry.

Because the system is reduced to a sensing unit and indicating unit, it weighs 50% less than previous three-

unit systems. Fewer wires and connectors are needed. 158 separate parts are eliminated. Maintenance problems are brought to the minimum.

And it costs less.

With the industry's need for smaller units — and with the industry's problem of smaller budgets — the Avien Two-Unit Fuel Gage arrives at the right moment.

Every month, Avien produces over ten thousand major instrument components for the aviation industry.

If you haven't yet inquired about the Two-Unit Gage, right now is the time to do so.



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Don't look for radical changes in Air Force's fiscal 1955 budget. Joint Chiefs of Staff's "new look" started too late to have much impact.

Plan is to have 120 wings by June, 1955, an increase of five over mid-1954. Plane procurement will continue at high level through fiscal '55; cuts in defense spending (possibly \$3 billion to \$3.5 billion) will come from Army and non-air Navy activities.

Minimum of 127 wings is to be attained by June, 1956, and Pentagon sources say JCS and Defense Secretary Wilson have agreed to 137 by mid-1957. JCS has calculated U. S. military needs through fiscal '57, and Chairman Arthur Radford says emphasis will be on airpower and atomic weapons. He carefully adds, however, that under most circumstances "air forces must be complemented with other forces" for an "indeterminate" future period.

*

Proposed CAA budget for fiscal 1955 is now being estimated, generously, at \$115 million, excluding any Federal aid to airports.

Budget Bureau cuts brought recent \$9.4 million reduction in annual CAA spending to above the \$13 million mark. Brunt of cuts is borne by salaries and expenses and establishment of air navigation facilities.

In contrast to fiscal 1954, Air Navigation Development Board request escaped unscathed.

*

Some airlines believe Post Office moved too fast in announcing it would use 45¢ ton-mile carriers instead of 53¢ lines for mail carriage on competitive routes, effective January 1. Many details should have been ironed out first.

Only course open to 53¢ lines is to ask CAB to allow them to meet 45¢ rate. They'll be making the request without knowing how it will affect their overall picture—whether rates will be raised on non-competitive routes or whether other pay adjustments will be made.

Real purpose of PO move, some observers insist, is to re-open all mail rates in hope of forcing down both 53¢ and 45¢ service pay levels.

*

There's opposition within Air Force to Rand Corporation study's conclusion that a large turboprop transport will be best future carrier of military supplies.

The possible future capabilities of a turboprop are being unfairly compared with today's straight jets, it's claimed. Only advantage seen by opposition for turboprop is low fuel consumption; contention is that this would disappear if bypass jet engine were considered.

*

North American sales rights for turboprop Bristol Britannia can be expected to be taken over by Canadair Ltd. It's significant that, in addition to building a reconnaissance version with Wright Turbo-Compounds for RCAF, the Montreal company plans a parallel line of the original turboprop-powered model.

Canadair Britannia will have greater sales prospects in North America than Bristol model, because it will be largely "Americanized"—instruments, accessories, and so forth.



The Washington View

Only the USAF Escapes

President Eisenhower early last week gave his personal attention for the first time to the proposed military spending program for fiscal 1955.

The program, which was presented at the White House by Deputy Secretary of Defense Roger Kyes and Assistant Secretary Wilfred J. McNeil, reportedly calls for reductions in all the services except the Air Force. Only the Air Force is to be permitted a continued expansion, and then with just a slight increase. Observers consider that the Pentagon apparently came up with a military budget for next year which is a compromise with the "new look" just rendered by the Joint Chiefs of Staff.

The Pentagon's future program was to be under constant review throughout the week. Once the President grants his approval, there were still to be further sessions of review by the Chief Executive in conjunction with the Cabinet, the National Security Council, and other Administration leaders. And last but by no means least, the Republican congressional leaders had to be advised.

New Role for MATS

There are indications now that the Air Force has completed its study of the Military Air Transport Service aimed at a possible revamping of the airlift operation. Although no decisions have been announced, the Air Force most certainly will broach a new plan for MATS operations by the time Congress convenes.

It was congressional pressure earlier this year, particularly from the House Appropriations Committee, that prompted the Air Force study, which has been conducted by the Deputy Chief of Staff-Operations.

What Congress wants, and demanded, is a more economical airlift operation for the military services. The major recommendation has been for a change in MATS to an operation along the lines of the Navy-operated Military Sea Transport Service. Full support to this proposal has been given by top Defense Department officials.

In addition, the Air Force is also seriously considering the transfer of a number of

MATS' present functions to other AF commands. It has finally been recognized that certain of the functions now performed by MATS do not contribute directly to the airlift, a Pentagon spokesman points out. He said such changes have been under discussion for some time. Those MATS service that are likely to be shifted include communications, weather, rescue, resupply, photographic, and charting.

Days of Decision at CAB

Make-up of the Civil Aeronautics Board in 1954 should be decided in the next few days by the Administration. President Eisenhower must act on CAB Vice Chairman Harmar D. Denny's membership term, which expires December 31, as well as on the chairmanship of the Board, which is a designation made annually from the White House.

There is no question that Denny, who has had less than a year in office, would like re-appointment to a full six-year term as a member. Moreover, it is not a secret that he would be receptive to the chairmanship if it were offered to him. For that matter, all three of the present Republican Board members are actively interested in the chairmanship for next year.

Incumbent Oswald Ryan, whose membership has another year to run, is believed wanting to serve out his remaining year as chairman. The other Republican Board member, Chan Gurney, would also be a strong candidate for CAB chairman if Ryan is not redesignated.

What's Coming Up

Although the second session of the 83d Congress meets in less than three weeks, there has been little to indicate what can be expected in the way of a legislative program for civil aviation. Congress will, of course, wait to receive the Administration's overall program for the coming year, as well as any proposals that will be forwarded by the various executive departments and agencies.

The responsible standing committees, however, have been preparing for a number of items which are assured of receiving considerable attention. These naturally are in addition to the customary appropriation bills for both CAA and CAB. They include Federal airway user charges, expedited mail plans, additional air mail subsidy separation (establishing compensatory rates based on cost of service), transport-prototype assistance for the local service airlines, and free or reduced-rate air transportation provisions for the clergy.

Undoubtedly the most serious item that will confront civil aviation this year on Capitol Hill will be the Commerce Department's request for the imposition of user charges for the CAA-provided facilities. Another item of almost equal importance will be the handling of air mail subsidy as a direct appropriation to CAB for the first time.

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FOR a few fleeting hours The World's Long-Distance Record for powered flight stood at 120 feet. The endurance time was twelve seconds, and the altitude—ten feet—was sheer high-flying madness.

What happened on Kill Devil Hill that chilly December morning fifty years ago still stands as the greatest milestone in the conquest of flight.

Even in this day, when the glittering flash of silver wings precedes the sound of their passage—all the proud achievements which have since swelled the log-book owe their existence to the men at Kitty Hawk.

Goodyear has played a consistent part in those entries: the first Aeroplane Tire, 1909, which served on early Wright bi-planes as they set new records; Stay-Tight Aeroplane fabric which gave new lift to their wings.

Then came the bullet-sealing fuel tank, the famed Single Disc Brake, the Cross-Wind Landing Wheel, Iceguards and many other Goodyear pioneering advancements.

Almost since the very year when events on Kill Devil Hill changed the world, Goodyear Aviation Products have contributed importantly to progress in the air.

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December 21, 1953

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When & Where

Jan. 8-11-11th Annual Miami-Havana Air Cruise, sponsored by Florida Air Pilots Assn. and Cuban Tourist Commission.

Jan. 10-12-Institute of Surplus Dealer trade show & convention, Madison Square Garden, New York.

Jan. 12-18-Society of Automotive Engineers annual meeting, Sheraton-Cadillac and Statler Hotels, Detroit.

Jan. 18-22-American Institute of Electrical Engineers, winter meeting, Statler Hotel, New York.

Jan. 21-23-Agricultural Aircraft Assn. annual convention, Bakersfield Inn, Bakersfield, Calif.

Jan. 25-28-Plant Maintenance & Engineering Show, International Amphitheatre, Chicago. Conference at Conrad Hilton Hotel.

Jan. 25-29-Institute of the Aeronautical Sciences, 22d Annual Meeting, Astor Hotel, New York.

Feb. 3-5-Society of Plastics Industry, 21st Annual Division conference on reinforced plastics, Edgewater Beach Hotel, Chicago.

Feb. 4-Instrument Society of America, 21st Annual Regional Conference, Statler Hotel, New York.

Feb. 11-12-2d Annual Western Computer Conference & Exhibit, sponsored by American Institute of Electrical Engineers, Institute of Radio Engineers & Association for Computing Machinery, Ambassador Hotel, Los Angeles.

Feb. 21-23-3d Annual Texas Agricultural Aviation Conference, Texas A&M College, College Station, Texas.

Mar. 22-25-Institute of Radio Engineers National Convention, Waldorf Astoria Hotel & Kingsbridge Armory, New York.

Apr. 12-14-Airport Operators Council, 7th Annual Meeting, Tampa, Fla.

Apr. 12-15-Society of Automotive Engineers, Aeronautic Meeting, Production Forum & Aircraft Engineering Display, Statler Hotel, New York.

Apr. 29-30-American Society of Tool Engineers, 10th biennial industrial exposition, Convention Center, Philadelphia.

May 5-7-3d Int'l Aviation Trade Show, sponsored by Aircraft Trade Show, Inc., 71st Regimental Armory, New York.

May 16-19-American Association of Airport Executives, National Convention, Standiford Field, Louisville, Ky.

June 7-14-Society of Plastics Industry, 6th National Exposition, Cleveland, O.

INTERNATIONAL

Apr. 5-6-Society of Plastic Industry (Canada) Inc., 12th annual conference, Mount Royal Hotel, Montreal.

May 12-14-Engineering Institute of Canada, Annual Meeting, Quebec.

May 31-June 11-Canadian International Trade Fair and National Air Show, Toronto.

AMERICAN AVIATION



Tracking flight path of early Boeing guided missile.

On its way—a supersonic missile of defense

Boeing's F-99 Bomarc is an aerial destroyer, designed to strike enemy bombers attempting to attack the continental United States. It is a logical outgrowth of Boeing's extensive earlier developmental work in the guided missile field.

The F-99's rocket engine hurtles it from the ground to its operating altitudes, and to speeds beyond those of sound. During test flights the unmanned F-99 broadcasts to earth a complete record of what's happening. This data, recorded on tape and processed through electronic computing machines, furnishes information about

speed, temperature changes, fuel consumption and countless other factors vital to continued progress in this complex field.

Bomarc is designed to carry out its mission under the guidance of radar and other electronic equipment. These ingenious devices control the F-99's flight path and guide the missile into position to destroy the target aircraft.

Boeing's pilotless interceptor experience is not confined to work on the Bomarc project. Its earlier program, also sponsored by the Air Force and known as GAPPA, produced rocket missiles that attained speeds in excess of 1,500 miles

an hour. Today Boeing is devoting a substantial amount of its engineering effort to developing complete systems of air defense.

Guided missiles, along with strategic jet bombers, are a strong deterrent against attack. In each of these fields, Boeing's contributions are characterized by unyielding integrity of design and construction—and by the sound, imaginative kind of research that produced the revolutionary B-47 Stratojet and the eight-jet B-52 Stratofortress. These advanced aircraft, in common with the F-99, bear a name you can depend upon: Boeing.

Boeing is now building a prototype jet transport, designed to be adaptable for either military or commercial use. The new plane has the benefit of Boeing's unparalleled experience in multi-jet aircraft. It will fly in 1954.

BOEING

Letters

AIRBORNE RADAR

To the Editor:

Last winter we prepared a report, "Calculated sensitivity of airborne weather radars," which you reviewed enthusiastically in your March 30th issue of *AMERICAN AVIATION* magazine. Your enthusiasm, by the way, exceeded ours on one point: while the things you said reported our findings tersely and specifically, your half-tone illustration compared a high-power big-dish set of 5.7 cm with a low-power set with a smaller dish at 3.2 cm. We actually compared the performances of sets using the two wavelengths, but otherwise having identical characteristics.

Since the time of that release, we have received numerous inquiries about our work. Some of these inquiries we have found rather inconvenient. When we are asked how we propose to fit a 30" dish into a given aircraft, we can only say we don't know. It's not our business. To the best of our knowledge, ATA and Arinc have considered this matter and they think it can be done.

The development of airborne weather radar involves not one but many tough problems. ATA and Arinc have been working through them methodically. We felt honored to be consulted about one of these problems: what wavelength would provide a weather picture satisfactory in airborne use?

It may be useful to enlarge on the nature of this weather radar picture.

The eye can see shower-cloud formations very nicely through clear air. Radar can see the precipitation pattern through any sort of air, and

through cloud. This is a lot better. Radar can also see precipitation *through* precipitation. This is a further big help, just as it's a big help for a doctor using X-rays to see body structure through body structure.

A wavelength which is highly attenuated by rain would reveal the nearest outlines of all showers; the picture revealed would be similar to the visual picture of shower clouds in clear air. It would be a very helpful picture. Wavelength 3.2 cm can do that and more, for it can penetrate all clouds and 10 or 20 miles of 10 mm-per-hour rain. But it is seriously weakened by every mile of heavy rain that the pulse passes through.

The pattern presented on the display screen depends in a complicated way on the target rain and the rain passed through. As a rain map, therefore, it is pretty distorted, except for the "leading edge" of rain in every direction. On a "bad weather" map, which is more closely what a pilot is interested in, this distortion may be most misleading.

Most embarrassing, to our way of thinking, would be the complete lack of knowledge about the "no-signal" regions lying beyond regions of strong echo. It requires a strong mental effort (which it might be unfair to demand of a busy routine observer) not to associate no-signal with no-rain. And this in view of the fact that the screen on a rapidly moving aircraft would change appearance all the time as the diminishing range enhanced the penetrating power of the radar.

At longer, less attenuating wavelengths, regions without signal can be relied on as being regions of no intense

target. At 3.2 cm, they must be written off as uncharted territory.

The principal use of the equipment has been assumed to be to help the pilot find his way through weather with improved comfort and safety. If it were a matter of complete weather avoidance, a case might be made for use of a wavelength which sees only the leading edges of precipitation. But for flying *through*, one should see *through*.

We think, as a result of our study, that 5.7 cm is best for this purpose. The powers and dish sizes considered we accepted on the authority of our sponsors. Performance as a function of wave length is the one point we are prepared to support directly and precisely. We trust that Arinc could support similarly the other factors of the argument for a 5.7 cm airborne radar.

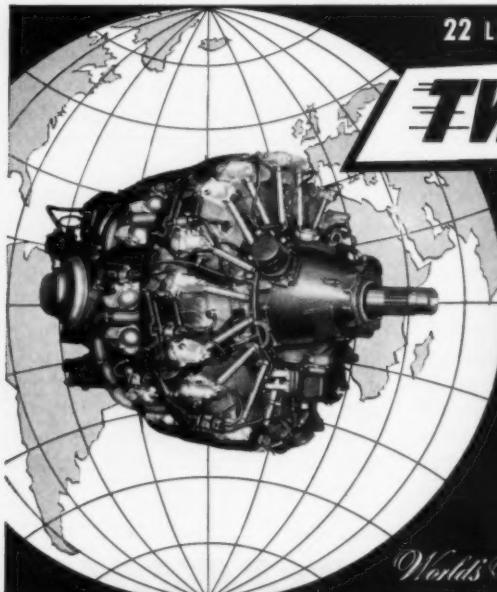
It does strike us as generally true that there is no use transporting any equipment—whether an airborne radar or a six pound anti-tank gun—which is one size too small.

J. S. MARSHALL

WALTER HITSCHFELD

Department of Physics
McGill University
Montreal, Canada

(Responding to reports in industry that this publication had placed a misleading interpretation on an airborne weather radar report by McGill University's Drs. J. S. Marshall and Walter Hitschfeld (March 30 issue), *AMERICAN AVIATION* wrote the authors for clarification and the reply is reproduced in full. For latest report on airborne weather radar activity see news story page 16.—Ed.)



22 LEADING WORLD AIRLINES HAVE SELECTED TURBO COMPOUNDS

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cuts trans-world travel time with
TURBO COMPOUNDS
in the **LOCKHEED Super CONSTELLATION**



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CORPORATION • WOOD-RIDGE, N. J.

World's Finest Aircraft Engines



Convair speeds you on your way *...after the flight, too!*



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CUTLASS ABOARD A CARRIER AT SEA

"Spotting a Cutlass"

The Navy's sleek, twin-jet F7U-3, with swept-wings folded, is towed to its spot on a carrier flight deck during tests at sea. The Cutlass is designed to be a top-performance member of America's Air Power team.



Chance Vought Aircraft

DALLAS, TEXAS

ONE OF THE FOUR DIVISIONS OF UNITED AIRCRAFT CORPORATION



Editorial

More Than a Birthday

ALL successful corporations eventually reach their twenty-fifth birthdays and most of them, at least, issue brochures to mark the occasion. So it is with Kollsman Instrument Corporation, which has just issued an attractive brochure entitled "Twenty-five Fruitful Years."

But there is something special about the Kollsman report quite apart from its glowing record of achievement in the aviation field. In a place of prominence is a statement signed by Frank J. Alexander, president of Precision Lodge No. 797 of the International Association of Machinists, extending the hearty wishes

of the union to the company on its birthday. For eleven years Lodge No. 797 has been the bargaining agent for production and maintenance employees and during that time there has been no loss of work hours to the company and no loss of pay to any of the employees. But let Mr. Alexander tell the story:

Credit Equally Shared

"The union is proud of this record and has every reason to believe that the company is equally proud of it. The credit is not due to any one side but must be shared equally by the company and the union. During the long eleven years the disagreements have been many. This was especially true during the early years of our relationship.

But as each side matured in this relationship, confidence in one another was planted and grew, and despite disagreements and misunderstandings that arise from time to time and despite differences of opinion . . . the hard earned respect of each side for the other has enabled us to live with each other. All problems were successfully resolved either by compromise or by one side convincing the other of the justness and equity of its position.

Democracy in Action

"This is democracy in action. This is the American way of handling labor-management relations, and we hope to keep it that way. Problems are bound to arise in the future. We are confident, however, that, if both sides approach the problem as they have in the past, our record will continue undisturbed.

"The life blood of a labor union is improvement and advancement . . . However, the life blood of industry is also improvement and advancement. That is our common goal. That is our mutual interest. We believe that industry must continue to improve through increased profits, through increased production resulting from increased efficiency brought about by engineering improvements, methods improvements, and so on—in short, by 'know how.'

Labor's contribution is its work. A fair and honest day's work is its obligation. We also believe that labor too must

continue to improve its standard of living. Labor cannot and must not stand still. As labor has over the past years improved its standard of living and its social benefits, industry has marched forward as well.

"There can be no improvement for the one without improvement for the other. Therefore, each must have an understanding not only of its own problems, but also of the other's problems . . ."

To our mind, this is a very praiseworthy and understanding statement, a genuine credit to Lodge No. 797 and to Kollsman Instrument Corporation. Would that this high level approach existed everywhere!

Bless The Lady

From the ever-alert Tucson Airport Authority comes a reprint of a letter to the editor of the *Arizona Daily Star* which should find its own niche in aviation history. Here it is:

"November 4, 1953
Editor *The Star*:

"I am a long-time booster for Arizona and Tucson, having arrived here as a child in 1926, and I am vitally concerned with maintaining our property values and attracting our winter visitors. For I, too, am a property owner and a resident. And I, too, hear the jets. But far from considering it an 'evil' noise and a 'terrible condition,' I snuggle more securely in my bed, for I know that the sound is a friendly sound—it is being made by our jets which are being piloted by our boys—to protect our country and our lives.

Never Enough Jets

"Mr. Sieber complains: 'Surely there is enough noise of jet motors flying at night over Tucson without this added evil of grounded jets roaring into the night.' Not for me, Sir. There will never be enough jet engines flying day or night over Tucson to annoy me. Every time I hear one, I look up with pride and humility and gratitude, and—thinking of those who perfected the planes and those who pilot them, and for what purpose—I say fervently in my heart: 'God bless them.'

"Yes, I agree with Mr. Sieber that nights are made for sleeping. But there are real and terrible evils in this world which do not sleep, and which could fill our nights with a great deal more discomfort than the occasional reassuring roar of an American jet!

"We can sound-proof our bedrooms, but they would make darn poor bomb shelters.

"Sincerely,
s/ Mrs. Frances Ware
5514 East Texas
Tucson, Arizona."

Other airports throughout the country, please copy. And many thanks, Mrs. Ware.

. . . WAYNE W. PARRISH

diversification

at Lockheed

in California

means

better

careers

for

engineers

report on diversification at Lockheed

diversified development projects

The most diversified development program in Lockheed's history is under way—and it is still growing. Lockheed recently announced contracts for the highly advanced XF-104 fighter and a study of nuclear energy applications to aircraft. Other projects include work on jet transports and missiles.

diversified production

The result of diversified development in the past can be seen in the wide range of planes now in production. Huge luxury airliners, cargo transports, jet fighters and trainers, bombers and radar search planes are rolling off Lockheed assembly lines. Twelve models are in production.

Lockheed AIRCRAFT CORPORATION

BURBANK, CALIFORNIA

Lockheed's program of diversified expansion has created openings for:

aerodynamics engineers

aerodynamicists "A"

aerodynamicists "B"

g. engineers (for aerodynamics work)

a college degree in aeronautical engineering or a mechanical engineering degree with an aero option.

thermodynamics engineers

thermodynamicists "A"

thermodynamicists "B"

g. engineers (for thermodynamics work)

a college degree in aeronautical engineering or a mechanical engineering degree with a thermo, aero or power plant option.

In addition, Lockheed's diversified expansion program has created immediate openings for:

service manuals engineers

flight test engineers

design engineer "A"

design engineer "B"

seven years' training and experience including four years' university engineering training and three years' layout drafting or shop liaison in aircraft or closely allied fields.

g. engineer — draftsmen "A"

one and one-half years' training and experience including four years' university engineering training and 18 months' detail or layout drafting on aircraft or related fields.

g. engineer — draftsmen "B"

an engineering degree from a recognized school of engineering. Experience is not required of recent engineering graduates.

Lockheed invites qualified engineers to apply for these positions. Coupon below is for your convenience.

Mr. E. W. Des Lauriers,
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Lockheed AIRCRAFT CORPORATION

Burbank, California

Dear Sir: Please send me an application form and illustrated brochure describing life and work at Lockheed in California.

my name

my field of engineering

my street address

my city and state

DECEMBER 21, 1953

Industry Spotlight

Firing tests have begun on two new surface-to-surface guided missiles, Bell Aircraft's Rascal and North American Aviation's long-range Navaho. The Pentagon, meanwhile, is preparing to send its first guided missile squadron—equipped with Martin Matadors—to Europe next year.

Saunders Roe turboprop Princess flying boat has now completed about 80 hours of flying, but most of the \$700,000 allotted for test flights remains unspent. The British aircraft, which may one day be used for trans-Atlantic service, is currently using de-rated Proteus engines which practically limit flights to 20,000 feet. The 220-seat plane, with a design all-up weight of 315,000 pounds, is the only one flying. Two sister craft are in a semi-cocooned state near Southampton.

Proposal for an all-jet model of the Turbo-Compound-powered Neptune patrol bomber has been submitted to the Navy Bureau of Aeronautics by Lockheed. One P2V is currently flying with two Westinghouse J34 engines suspended in pods for added boost.

CAA is considering a program whereby all lightplane manufacturers and firms making modifications to existing lightplane designs would be compelled to conduct their own airworthiness certifications, thus enabling the agency to save money. Some lightplane builders have been voluntarily doing their own tests.

Boeing's B-52 has been labeled faster than the B-47 Stratojet by Deputy Defense Secretary Roger Kyes and thus is presumably the fastest bomber in the world. First production models of the Stratofortress, powered by eight 10,000-pound-thrust J57's, will appear late in 1954. Second-source production of the B-52 is moving ahead, with 11,700 engineering drawings shipped from Seattle to Boeing-Wichita (see photo, page 16).

France's SNCASO SO 4050 Vautour light bomber will have a range without armament of 3730 miles and maximum speed in level flight of 620 mph. With a wing span and length of about 50 feet each and 35 degrees of sweep-back, the plane will be able to take off and land (without using a drag parachute) on runways of less than 2625 feet.

Sikorsky's large S-56 single-rotor helicopter powered by two P&W R-2800 engines, which has been given the H-37A designation by the Army and Air Force, and is labeled HR2S-1 by the Navy and Marines, is now undergoing tie-down tests. The S-58, in production for several of the services, is called H-34A by the Army and USAF, HSS-1 by the Navy, and HUS-1 by the Marines.

Douglas, which has now built about 450 aircraft of the DC-6 type, estimates that the break-even point was attained only at about the 300th plane.

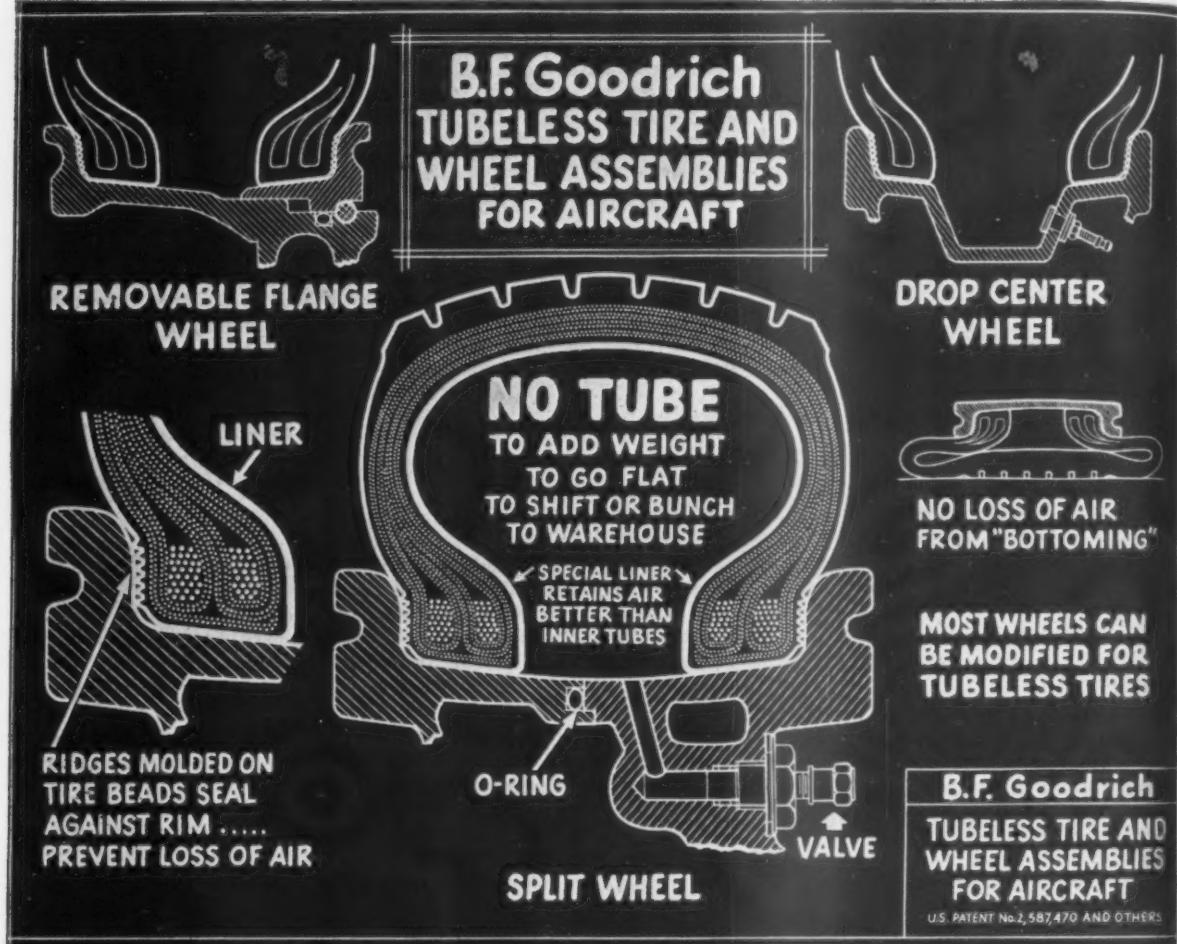
Unduplicated aircraft backlog on September 30 stood at \$17,972 billion versus \$18,595 billion three months earlier, marking the first time since Korea that there has been a substantial drop in orders on hand. Military orders still represent 94% of the airframe, 97% of the engine, and 90% of the propeller backlog.

A new midget ramjet-powered helicopter, now being developed by newly formed Bensen Aircraft Corp. of Raleigh, N. C., weighs only about 100 pounds but company president Igor Bensen claims it will lift 400. Top speed of the aircraft, which uses two ramjets at the rotor blade tips, is 80 mph. Price in quantity production, says Bensen, will be \$1000 per unit.

RESEARCH KEEPS

B.F. Goodrich

FIRST IN RUBBER



New Tubeless Tire for airplanes cuts weight, gives safer landings

TAKE OUT the inner tube and you do more than save weight, simplify assembly. You get a high-pressure airplane tire that's safer, too. B. F. Goodrich engineers were the first to develop and produce one. The blueprint above helps show how they did it.

Instead of an inner tube, the B. F. Goodrich airplane Tubeless Tire has a patented inner liner that's part of the tire itself. There is *no tube* to add weight. No tube to go flat—to bunch up or shift during landings and take-offs. Instead of tire and tube, there's only one unit to mount. Only one unit to warehouse, too.

The patented inner liner retains air much longer than conventional tubes. Ridges molded on the outside of the tire bead prevent air loss around the rim. On two-piece wheels, a rubber O-ring seal keeps air from escaping through sections. A special Navy "bottoming" test shows the new BFG airplane Tubeless Tire loses no air even when compressed flat to the rim.

The B. F. Goodrich airplane Tubeless Tire will soon be in general use on Grumman Cougar jets in Navy service. It will soon be seeing service on other military planes as well as commercial

aircraft. It's another first in aviation tires from B. F. Goodrich, leader in rubber research and engineering.

Other B. F. Goodrich products for aviation include wheels and brakes, De-Icers, heated rubber, Pressure Sealing Zippers, inflatable seals, fuel cells, Rivnuts, accessories. *The B. F. Goodrich Company, Aeronautical Sales, Akron, Ohio.*

B.F. Goodrich
FIRST IN RUBBER

AMERICAN AVIATION



DECEMBER



PLOTTING BOARD, called Skiatron, is used here by technicians to follow radar tracks of Volscan-controlled aircraft.

Volscan: New Two-a-Minute Traffic Control

USAF's automatic electronic system feeds planes into landing pattern at intervals of 30 seconds.

By JOSEPH S. MURPHY

WITH the long range program to develop future air traffic control facilities virtually stalled under the pressure of economy in the Commerce Department's fiscal 1954 budget and the rejuvenation of the Air Navigation Development Board to restore the program moving at a snail's pace, the U. S. Air



Greene

DECEMBER 21, 1953

Force recently stepped into the lime-light with its candidate for a solution to the high density air traffic control problem.

The place was the USAF Air Research and Development Command's Cambridge (Mass.) Research Center and the occasion was the unveiling of "Volscan," an electronic system which automatically controls aircraft approaching a military base or airport and guides them into position to land at intervals as short as 30 seconds.

Development of Volscan (volume scanning) resulted primarily from a

USAF search for an answer to its back-to-base problem under combat operations, where traffic within a short time interval would be too heavy for manual control. In tactical operations, particularly in the case of jet fighters and bombers, any allowance for fuel-consuming traffic delays when returning would seriously reduce aircraft range.

It is this factor which project scientist Benjamin F. Greene, Jr., feels will justify the use of Volscan many times over, both in increased aircraft range and in fuel savings.

Greene does not confine Volscan's possibilities to the military application. He sees a definite need for a system such as Volscan in the civil air traffic



CONVENTIONAL AN/CPN-18 radar with special antenna screen modified for Volscan sights target aircraft 60 miles away.

control scheme, and predicts that it will be tried in commercial operations within the next five years.

For the present, with the bulk of Volscan development an accomplished fact, the USAF program calls for:

- **First installation** at some operating location where a military-civil traffic problem exists today;

- **Production** of a small number of units for an accelerated evaluation under actual operating conditions at military bases;

- **Final decision** on large-scale production of Volscan by top Air Force officials in the Pentagon.

With the prospect of added testing under actual operating conditions, it is rather doubtful whether any action on mass production of Volscan will come soon. Support for this supposition is seen in the understanding that another system which does the same job as Volscan, but which uses velocity variation instead of a change in aircraft heading to maintain traffic separation, is now in the earlier stages of development at ARDC Rome Air Development Center. A decision by the USAF to await the outcome of this work could delay a production move on Volscan.

One major factor in favor of Volscan is its low cost, both in development and that anticipated for production. Expense to USAF of Volscan project to date has only been about \$500,000, and the estimated price per copy for large scale production is said to be about \$100,000.

The basic Volscan system combines

a standard AN/CPN-18 surveillance type radar, electronic tracking and computing devices called Antracs (analog tracking), Datacs (data computers), and a communications system to link Volscan with the pilot of the airplane under control.

Under Volscan operation, the aircraft approaching a base is detected by a traffic operator on the radar scope, identified and then instructed on a rate of descent and airspeed normal for the particular type airplane.

The operator then "shoots" the radar target with a special photo-electrical cell gun which moves one of the tracking system "gates," represented by



TRAFFIC OPERATOR shoots target on radar scope with light gun.

a rectangular box on the scope, from a standby position to surround the target. By pressing a button, the operator assigns a channel of the Antrac-Datacs systems to the airplane, and the tracking system is set in motion to retain the identity of the airplane and to isolate it continually from all others.

When the aircraft is first accepted in the system a single computer Traffic Manager searches for an open arrival time for the airplane, selects a schedule which it can meet, and relays the information into the Datacs computer. The computer then continuously receives the radar video pulses representing the aircraft movement, converted into the form of smoothed-out d-c voltage signals by the Antrac unit.

The entire computer operation is based upon the airspeed and rate of descent assigned to the aircraft. Its job is to calculate the shortest flight time that can be attained in a direct path to the point of entry to an ILS or GCA landing.

Once this is determined, its function is to compute the error ratio as the flight progresses from the information received from the tracking system. The ratio of error—i.e., its actual performance compared to what it should be doing—is constantly computed. If the airplane is ahead of schedule, as indicated by a ratio of more than one, the computer signals a change in heading to a manually operated relay panel, where the information is transmitted by voice to the pilot.

For emergency operations that might require a straight-in approach by any one of the aircraft under control, merely pressing a button on a monitor panel will bump all other aircraft back in the estimated arrival schedule by a change of heading.

According to scientist Greene, a system such as Volscan fits into the overall Air Force future planning for an all-weather air base control tower which would also house a fixed GCA (Ground Controlled Approach) installation and bring the control of air traffic by Volscan within the same four walls as the system controlling the final approach and actual landing.

Although in its present configuration Volscan uses a manual relay of information to the pilot, it is also adapted to the use of a standard data link being developed by the USAF. This is to be installed in many military aircraft for defensive purposes.

With the data link installed, the instructions of the Datacs computer could be displayed on a Zero Reader type of instrument, or they could feed a GCA, ILS, or AGCA system, the military's experimental automatic ground controlled approach.

Two Air Traffic Resignations in CAA

On January 1, 1954, the Washington CAA air traffic control activity will suffer the loss of two key figures. Clifford P. Burton, until recently the chief of the agency's airways operations division in the Office of Federal Airways, has applied for retirement on that date, and V. J. Kayne, assistant chief, has resigned.

Burton and Kayne represent a combined 27 years of service in CAA, almost entirely in jobs supervising its air traffic control functions. Their departure, either directly or indirectly, results from recent economy measures and reorganization within CAA.

On November 1, 1953, Burton left the post in Federal airways to become a planning analyst in the office of program planning, a job eliminated in recent cutbacks. Kayne joined CAA in 1941 as head of the control tower at Washington National Airport and has been in his present post since 1942. A non-veteran who was refused leave from CAA during World War II, Kayne is understood to be planning to enter private business outside of aviation.

States Protest Range Decommissioning

CAA's proposed decommissioning of L/F four-course radio ranges has met with opposition from the National Association of State Aviation Officials. The organization feels that decommissioning should not be undertaken until VOR has proven that it "will provide substantially the same information with the same degree of coverage and reliability to all aeronautical users who reasonably require such information."

NASAO added: "We do not feel that the obligation of the Federal government is now limited to airways for IFR flight."

Subsidy Money Gets By Budget Bureau

The airlines' subsidy bill for fiscal 1955 has passed its first major Administration test virtually intact. The Budget Bureau, which reflects White House thinking in such matters, approved all but \$20,000 of an \$80,252,000 subsidy appropriation requested by CAB.

The Budget Bureau action will not be made public officially until the President submits his annual budget to Congress next month.

Not so successful, however, was CAB's request for a "modest increase"



More power is slated for Northrop's F-89D Scorpion long range interceptor. Following successful high altitude tests by Northrop and the Allison Division of General Motors it was revealed that Allison J35-A-35 turbojets will go into the Scorpion. Improved flight performance and greater fuel economy were cited as results of the tests.

Wilson to Put Vance Report Into Effect

The so-called Vance report, which called for a multi-billion-dollar program to provide standby plants and machine tools over the next few years, has apparently been accepted by Defense Secretary Charles E. Wilson and his aides.

Drawn up by a special Office of Defense Mobilization committee headed by Harold S. Vance, board chairman of the Studebaker Corp., a year ago, the report said future outlays for defense could be cut appreciably if such a program were adopted (AMERICAN AVIATION, February 16, 1953). Both the 1954 Truman and Eisenhower budgets requested \$500 million to get the program started, but Wilson testified that none of the money would be spent until and unless it was decided that Vance's ideas had merit.

Now Defense Department spokes-

men have told AMERICAN AVIATION that while none of the \$250 million finally authorized by Congress this year has been obligated as yet, every penny will be obligated by the time the fiscal year ends next June 30. Only decisions on which types of tools will be ordered have held up obligations, they added.

The Defense statement presumably means that more funds for "Reserve Tools and Facilities" in the Office of the Secretary of Defense will be requested in the fiscal 1955 and future budgets.

Other members of the ODM group which made the recommendations in December, 1952, include Lewis L. Strauss, now chairman of the Atomic Energy Commission, and Lt. Gen. K. B. Wolfe (USAF, Ret.), former Deputy Chief of Staff for Materiel.

in the \$3.8 million appropriation required to run its own shop. Reliable reports indicate the proposed hike has been eliminated by Budget. In effect, it amounts to a reduction, since normal salary increases and other cost hikes dilute the total.

U. S. Can Now Build Economical Jet: AA

Jet transport economy of operation is no longer a deterrent to its entry into the U. S. scheduled airline passenger picture, according to American Airlines' chief engineer M. G. ("Dan") Beard.

Speaking informally during a recent meeting of the American Society

of Mechanical Engineers, Beard explained that the first jets offered by U. S. manufacturers were directed at high speeds with relatively low passenger provisions and would have required an extra fare charge to operate at a profit.

Since that time, however, the passenger provisions have been raised from 60-65 seats to a range of 80-90, and speeds have been reduced some 25 to 40 mph. The combined effect has produced an economical airplane that could be operated profitably under the present fare structure, he said.

The biggest single factor delaying the purchase of jets by domestic airlines, according to Beard, is their high initial cost and resulting high amortization charges.



Faster than the B-47 is Boeing's eight-jet B-52, shown above. Revelation of the long range bomber's speed, which was made by Deputy Defense Secretary Roger M. Kyes, would put it in the over-650-mph class (see p. 11).

Military Rapid Write-Offs Suspended

Issuance of rapid tax write-off certificates covering new military aircraft plants and tools has been suspended by the Office of Defense Mobilization pending completion of a review to determine whether further expansion is necessary. At the same time ODM continued unchanged a goal to permit the five-year write-off of commercial airliners.

Of ODM's 237 expansion goals, 120 were closed out because the desired programs had been attained, 49 were suspended until a further review is completed, and 68 remained eligible under the certificate of necessity program.

More than \$1 billion of ODM's \$1.3 billion in new military aircraft plants and equipped has been approved

for five-year tax amortization. In the case of commercial airlines, the goal was 600 planes. Applications for only about 400 have been granted.

Other suspended goals include machine tools, presses and forging equipment, and "elephant" machine tools. Programs still open include alkylate (key ingredient for aviation gasoline), heavy aluminum aircraft forgings, tapered aluminum sheet, titanium metal, molybdenum, nickel tungsten ore, selenium, and military electronic products.

Among the goals closed out were tubular heat exchangers, miniature electric motors, and plants to produce precision optical equipment.

Non-Mail Carriers May Carry Mail, CAB Rules

The CAB, by a split 3-2 vote, appeared early this month to have opened a "big door" for non-mail airlines to participate in the transportation of mail—a field hitherto reserved for carriers specifically certificated for that purpose.

The vote was on the legal question of whether CAB, under the Civil Aeronautics Act, has the power to grant exemptions to non-mail carriers to carry mail. Vice Chairman Denny and Members Lee and Adams found the Board has such power. Chairman Ryan and Member Gurney disagreed in a minority report.

The stage is now set, barring a change on reconsideration, for CAB to act on numerous exemption applications filed several months ago when

Postmaster General Summerfield announced his experiment to move first class mail by air in certain areas at rates substantially under the compensatory rates now received by certificated lines for carrying airmail.

Applicants for such authority are Slick Airways, The Flying Tiger Line, Overseas National Airlines, Riddle Airlines, Independent Military Air Transport Association (for 11 of its members), and Aircoach Transport Association (for its 43 non-scheduled airline members).

The CAB opinion was received enthusiastically by the applicants. Robert W. Prescott, FTL president, Thomas L. Grace, Slick president, Philip A. Mann, Riddle v.p., and former Senator Joseph C. O'Mahoney, North American Airlines director, hailed it as a "significant step forward."

The certificated mail carriers made

no public account of their reaction but several officials told AMERICAN AVIATION that court action "unquestionably" would follow any exemptions granted by CAB under its new ruling.

Weather Radar Design Progress Rapid

With the adoption of a final specification for airline airborne weather radar expected to follow close upon United Air Lines' report of test results in evaluating RCA-built 5.7 radar, equipment development progress is reported in these other areas of design:

- **Antennas**—Present indication is that all modern transports except possibly the Douglas DC-4, DC-6, and DC-7 can accommodate a proposed 30" antenna. Aircraft for which installation appears feasible include Lockheed Constellation, Convair 240 and 340, Boeing 377, and de Havilland Comet.

- **Storage Tube**—Radio Corporation of America has completed a development model direct view storage tube said to be capable of halftone (as opposed to pure black and white) display. Company is understood to be carefully considering production of this tube.

- **Special Magnetron**—Exploratory work has been completed on the possibility of a single manufacturer producing a special six centimeter magnetron which would operate with the radar circuitry of more than one manufacturer.

- **Equipment Production**—Bendix Radio Division has been authorized to spend \$250,000 for airborne radar development. Target is to build and market a three centimeter radar with weight kept as close to 100 pounds and price between \$10,000 and \$15,000 for delivery in the fall of 1954.

RCA is presumably planning production of 5.7 cm radar, which has been favored to date by Aeronautical Radio, Inc., airlines electronic engineering committee (see Letters, page 6). Bendix contention has been that three centimeter radar has the advantage over 5.7 cm except for viewing storms through dense rainfall, conditions on which little data is available as to frequency of occurrence in operation.

PAA Orders DC-7B's

Pan American World Airways has announced the purchase of seven over-water Douglas DC-7 aircraft for delivery in 1955, confirming last month's reports. Dollar value of the order was placed at "about \$14,000,000." Confirmation was not obtainable on the report that the arrangement with Douglas Aircraft Co. includes an option for 12 or 13 more.

TITANIUM PRODUCTION . . . BARELY STARTED

1953: PRODUCTION 2,000
TONS PER YEAR

EXISTING GSA CONTRACTS
CALL FOR 13,200 TONS
PER YEAR . . .

PRESENT ODM GOAL SET AT
25,000 TONS PER YEAR . . .

IN 1951 DEFENSE DEPARTMENT
URGED 35,000 TONS PER YEAR . . .

AND BY 1960-1965: INDUSTRY ESTIMATES 250,000-500,000
TONS PER YEAR NEEDED

... BY
1956

Titanium Shortage Critical, Senate Told

Key industry figures predict trouble ahead if metal production doesn't expand rapidly.

IT WAS OBVIOUS last week that the U. S. aircraft industry's needs for titanium over the next few years would be tremendous. It was equally obvious that unless the Pentagon, the Office of Defense Mobilization, and the General Services Administration teamed up to expand production of the strategic metal in a hurry, the planebuilders' requirements would not be met.

As Sen. George Malone (R., Nev.) channeled his Strategic Metals Subcommittee of the Senate Interior and Insular Affairs Committee toward investigations of other minerals and wound up his probe of the titanium situation, the three government agencies began a drive to try to make up for lost time.

The subcommittee heard about the shortage of the so-called "wonder metal" at sessions in Washington and Los Angeles, and Malone's ultimate report was expected to point out that the nation's airpower might be in jeopardy if a rapid expansion were not ordered.

During the hearings, Malone's group heard from both military and civilian USAF officials, top aircraft industry spokesmen, and representatives of firms actually producing or hoping to turn out titanium:

• Brig. Gen. Kern D. Metzger, head of the Air Materiel Command's

Production Resources Division at Dayton, pointed out that 1953 titanium output would be only about 2450 tons, while Air Force needs alone would be for 3500 tons. He called for "an immediate expansion as fast as possible." He predicted that if a war should come and major mobilization of the industry should follow, the U.S. would need at least 800,000 tons a year by 1960.

• Secretary of the Air Force Harold E. Talbott indicated titanium is a "must" for future U.S. air power and declared, "We are woefully weak in producing 2000 tons a year."

• Curtiss-Wright president and chairman Roy T. Hurley reported his company alone could use 36,000 tons a year by 1956.

• Douglas Aircraft president Donald



Talbott



Hurley

W. Douglas, stressing the importance of the lightweight metal, stated that while Douglas now uses one to three per cent of the weight of a plane in titanium, "in 1957 we probably will be using in excess of 20%."

• Consolidated Vultee vice president Thomas G. Lanphier said his firm by 1960 would use nearly 40% of the weight of military aircraft in titanium. "We will be in trouble if we don't get it."

• Lockheed Aircraft president Robert E. Gross said his company would need 62,000 pounds next year and 152,000 in 1955. These figures, he added, might be doubled or tripled if the present price (about \$15 a pound) is reduced and quality is improved.

• Northrop Aircraft president Oliver P. Echols estimated that the Hawthorne firm would need 250,000 pounds annually in four or five years. Future Northrop designs, he said, incorporated 20% titanium.

• North American Aviation president J. L. Atwood predicted that while the F-100 uses only 5% titanium in the structure, "it is possible that 60 to 75% will be going into designs 10-15 years hence."

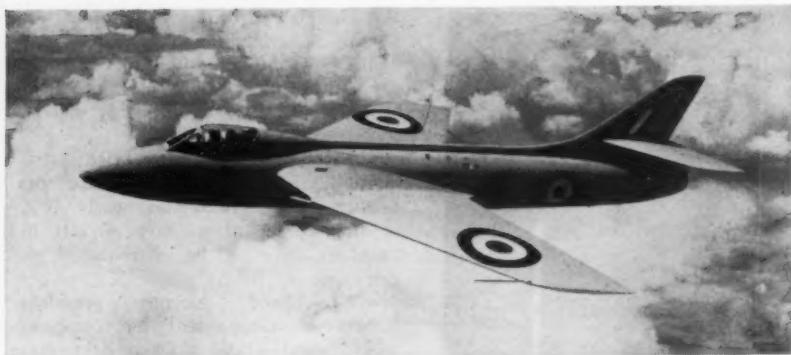
• Republic Aviation's chief development engineer, William O'Donnell, asserted that the metal is essential for new fighters and missiles. (Republic's upcoming XF-103 interceptor reportedly will be almost completely made of titanium.)

• Harvey Machine Co. president Leo M. Harvey, reporting on a private survey, said aircraft engine builders feel they can use 50,000 tons a year in 1955 and 50,000 more each successive year up to a minimum requirement (by about 1960) of 250,000 tons. Airframe builders, he added, have expressed similar needs, so that the total would be at least 500,000 tons annually.

• General Services Administrator Edmund F. Mansure assured Malone his agency would move immediately to contract for the 25,000 tons a year approved by the ODM.

Production of the vital metal has climbed slowly since 1946, when the U.S. Bureau of Mines reported the opening of a pilot plant to produce titanium in batch lots by the now-famous Kroll Process (named after William J. Kroll, a Luxemburger who was serving as a consultant to the bureau) but present GSA contracts and private production will result in only 13,200 tons a year by 1956.

The need for the metal is not new to the Pentagon. In 1951, the Defense Department officially set its requirement for titanium at 35,000 tons a year by 1956, but this was first cut to 22,500 tons by ODM and last summer increased to 25,000 tons.



HAWKER HUNTER, which is to be built by Belgium and the Netherlands.

Benelux Nations Ready to Build Hunter

Belgium and Holland will turn out 348 of the fighters for themselves, 112 for NATO through U. S.

By ROBERT M. LOEBELSON

(Editor's Note: This is another in the series of articles on the North Atlantic Treaty Organization's joint aircraft procurement program by AMERICAN AVIATION's manufacturing editor.)

AMSTERDAM, THE NETHERLANDS—Every man, woman, and child in the Low Countries is contributing the equivalent of \$6.46 toward the purchase of Hawker-licensed Hunter interceptors for the defense of Belgium and Holland. The U.S. is putting up another \$2.32 for every citizen to buy the same plane for use by NATO.

Under terms of the joint NATO-European aircraft procurement program, the United States is scheduled to contribute \$42 million, and the two nations, which have a combined population of 18.1 million, have more than met this sum by ordering Hunters with a value of \$117 million.

By splitting its \$42 million order between the two nations (\$24 million to the Belgians, \$18 million to the Dutch), the U.S. is scheduled to take delivery of 112 models of the plane which briefly held the world speed mark of 727.6 mph this fall. The \$117 million provided by the two Benelux countries will result in the delivery of 348 more Hunters: 192 for Belgium and 156 for the Netherlands.

It is a virtual certainty that the planes purchased by the U.S. for NATO will be returned to the two air forces for their own use. No other nation but Great Britain will be flying the Hunters, and the U.S. has also ordered 460 of

the swept-wing interceptors from England's Hawker-Siddeley group, which licensed production of the aircraft in the first place.

(Before the joint aircraft procurement program was announced last April there was some speculation that the Vickers Supermarine Swift might be the plane licensed to the Low Countries. Despite the fact that the Hunter has been officially announced as the interceptor to be produced by Belgium and Holland, Vickers officials are reported to be hopeful that the Swift, which beat the Hunter's speed mark, might still be substituted.)

Fokker Main Firm

Fokker Aircraft Co. here is the principal recipient of the Dutch and NATO orders for Hunter airframes, although some of the work has been subcontracted to two other Dutch firms, Aviolanda and de Schelde.

Belgium, cooperating with the complementing Dutch production, is responsible for output of Roll-Royce Avon engines, landing gears, and Hunter wing parts, some of which will be shipped to Fokker's factory here for final assembly for both the Dutch Air Force and NATO. The Hunters delivered by Belgium for the Belgian AF will be assembled from fuselages supplied by Fokker, while Belgium's planes for NATO will have fuselages airlifted from the Hawker plant in England to Gosselies, where Avions Fairey will do the assembly.

Other Belgian companies involved in the Hunter program are Société Anonyme Belge de Constructions Aéronautiques (SABCA) in Brussels, and

Fabrique Nationale d'Armes de Guerre Société Anonyme (F.N.) in Liege. F.N. will supply the Avon RA.7 engines (7500 pounds of thrust) for the Benelux Hunters.

The Belgian-Dutch cooperation on the Hunter production program is similar to that in effect when the two nations teamed up to build the Gloster Meteor, another British-licensed jet—a project which resulted in the delivery of about 330 Meteors by Fokker and Aviolanda to the Dutch Air Force. Number of Meteors operated by the Belgian air arm has not been revealed.

Although it is a third member of the Benelux triumvirate, tiny Luxembourg will take no part in the Hunter program, principally because the Duchy has no aircraft industry and no air force of its own. However, under terms of the Benelux and NATO agreements, the Hunters, Meteors, and other aircraft at the disposal of the Netherlands and Belgian air forces will be used for the defense of Luxembourg if that should prove necessary.

C-119 Subcontracts

Fokker is expected to play another important role in the NATO set-up. The Dutch firm's agreement with Fairchild Aircraft Division at Hagerstown, Md., is expected to result in Fokker becoming the principal subcontractor for overhaul and maintenance of C-119 Flying Boxcars operated by the USAF, Italy, and Belgium when Fairchild's recently opened Dutch subsidiary, Fairchild Aviation N. V., obtains such contracts from the USAF in Europe.

Fokker officials are also hopeful of landing another contract—one to produce the company's S.14 side-by-side jet trainer for NATO. Already preparing to deliver 20 of the S.14's to the Dutch Air Force, Fokker is convinced the trainer (which is now equipped with a more powerful Nene to replace the original Rolls-Royce Derwent engine) will meet NATO requirements for an advanced trainer and possibly a combat aircraft as well.

Third Quarter Profit Drops for Trunks

U. S. scheduled domestic trunk lines have reported a somewhat lower profit for the third quarter of 1953, compared to the same 1952 period. The decline is laid to expense increases.

Passenger revenues for the 1953 quarter were \$209,789,730, a 12.6% increase over 1952, with other revenues totaling \$24,962,319 and expenses hitting \$205,911,108 for a net operating income of \$28,840,941, a 17.6% drop below the 1952 quarter.

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TWO-LEVEL passenger-cargo terminal described during Air Cargo Day session is Navy Bureau of Aeronautics' design costing about \$1.3 million and planned for construction next year.

Military Neglecting Air Freight: Bunker

Far from being fully exploited, airlifts are used only as last resort, says transportation officer.

ALTHOUGH the value of air transportation for the supply of ground forces in event of war is generally recognized throughout the military services, and despite the conclusive demonstration of such individual feats of 100% air transport as the Berlin Airlift, the fact remains that air movement is still being used only as a last resort. It is not being exploited for its advantages in reducing pipeline inventories, increasing the flexibility of supply systems, and reducing the large supply stocks that have to be held in forward areas.

This personal evaluation of the cargo air transport situation as it stands today by U. S. Army Col. William B. Bunker, and presented for him by Col. A. B. Evans, highlighted the recent Fifth Annual Air Cargo Day activities sponsored jointly by the American Society of Mechanical Engineers, the Institute of the Aeronautical Sciences, Society of Automotive Engineers, National Security Industrial Association, and a newcomer this year, the Transport Air Group, Inc.

Although directing his discussion to the place of the helicopter as the aerial truck in the army of tomorrow, the chief of the air transport service division pointed to this failure to exploit, or fully evaluate, the indirect advantages of airlift as the greatest single deterrent to the real growth of military air freight.

Bunker feels that this same sort of failing may retard the expanded use of

the helicopter in Army operations, explaining that "any system which is used only for emergencies will never be able to develop."

With top military logistics personnel on hand, headed by Brig. Gen. William T. Hudnell, USAF, and close to 300 air cargo engineers and technicians from all areas of industry pursuing the answers to such perennial questions as the whereabouts of the true cargo airplane and the billion-ton-mile annual business, Air Cargo Day—1953 by any standard of measure was a successful one.

Top Level Lacking

To some it seemed to lack only the participation of top policy-making representatives from commercial air carriers and aircraft manufacturers to shed more light on the answers to these long standing questions.

The two-day session heard technical discussions on:

- **Aircraft design for loadability**—Truck-bed floor height is a must, a nine-by-ten foot loading door is desirable, and secondary doors will become a necessity in heavy cargo transports of 50-ton payload or more.

- **Passenger/cargo airline approach to air freight**—Simplification of tariff practices stands out among improvements needed to speed air freight service.

Placing the helicopter in its role as an aerial truck in the army of tomorrow, Col. Bunker views it as a machine with its own mission, and one of a nature in which speed and range are not particularly significant. For its purpose he sees little value in increasing speeds to 200 mph, particularly if with this increased speed the helicopter is

apparently to become excessively complex.

To Bunker the trend toward raising the speed and extending the range of the helicopter does no more than bring it into competition with the fixed-wing airplane, which, he feels, "undoubtedly will always be more economical and effective."

Bunker's answer is to perfect the helicopter for operation in the areas to which it is particularly suited—those not exploited by fixed-wing aircraft. He predicts that if the helicopter can be made to operate effectively in competition with truck and bus services, there will be no need for entry into the twin-engine aircraft area of operation. With better than 85% of all freight and passenger movements in the U. S. over distances of 50 to 100 miles, even a small percentage of this business would fill all the helicopters the industry could build for years to come.

As for today's helicopters, Bunker finds them expensive and difficult to maintain. The service life built into many important elements is discouragingly low and all machines have suffered frequent groundings to correct design or manufacturing errors.

Frequent teardown and inspection of components such as engines, transmissions and rotor systems are the second big maintenance factor, with performance today falling far short of the 1000-hour-overhaul goal set by the Army. To Bunker this is an impossible situation if the helicopter is to compete as an aerial truck.

Today, Bunker said, the helicopter requires about eight to ten hours of maintenance for each hour of flight, and the dollar value of parts installed per hour of flight exceeds the cost of crew and fuel. He did say, however, that some progress has been made in



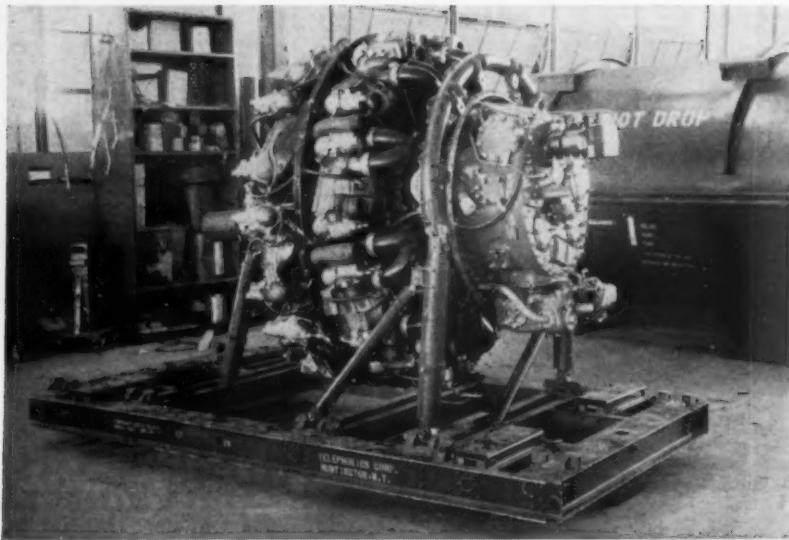
Bunker

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VERSATILE engine stand designed for Navy by Target Rock Corp. and built by Telephonics Corp., both of Huntington, N. Y., accommodates jet and piston engines.

the last year in persuading manufacturers to install larger engines to increase the service life and dependability of components of their machines. There is still much to be done, however, to make "a good work-horse instead of a high-bred show animal" out of the helicopter.

The true cargo airplane from the standpoint of loadability, according to MATS Lt. Col. George Hewitt, combines the factors of accessibility, size and shape of the cargo compartment, weight and balance characteristics, and floor design. Hewitt stressed these features:

• **Accessibility**—Truck-bed floor height is a must to preclude difficult handling operations and avoid the need for expensive and specialized cargo handling equipment. The main loading door should be about nine feet high by at least ten feet wide, with a second door not necessarily that large for transports of 50-ton payload or greater.

Door location varies with fuselage design. The tail loading design is preferred for the long, narrow fuselage, whereas a door location amidships is favored for the relatively short and wide fuselage, i.e., from 15 to 20 feet wide.

• **Cargo Compartment**—One of the biggest of MATS operational problems today is brought on by aircraft cabins of insufficient volume. A length-to-width ratio not exceeding four to one allows greater freedom of movement within the cabin when placing cargo. A compartment height above nine feet would be superfluous for current and foreseeable MATS needs. The best cabin cross section is rectangular, with a wide

side as the floor of the aircraft.

• **Pressurization**—A possible trend in thinking away from the concept of a completely pressurized cargo compartment to the idea of pressurizing only the crew area was noted in Hewitt's discussion of the turboprop and turbojet high operating altitudes and of the structural weight penalties and size limitations resulting from pressurization in such operations.

• **Loading Systems**—With the average weight of a logistic item placed at less than 100 pounds, a 50-ton payload airplane would require individual loading of 1000 or more pieces, a prohibitive figure. Unitization of shipments is thus virtually mandatory.

• **Weight and Balance**—Key factors limiting the effects of weight and balance problems in the true cargo airplane are: shorter fuselages to reduce moment arms; larger permissible cg travel; design with cg near middle of cargo compartment to minimize effects of cargo density variation; development of an integral device to indicate gross weight and cg at all times; prime consideration of the fuel-shift problem during aircraft design.

• **Floor Design**—The trend toward materials handling equipment with small wheels emphasizes the importance of a flush floor design. Of three types of cargo tie-downs in general use today, i. e. the integral fitting, screw-in or snap-in type, and the track system, only the integral type installed as flush as possible with the floor is acceptable for new aircraft designs.

The most realistic restraint limitations which dictate fitting and supporting structural strength are 3g forward,

1½g side up, and 1g aft. This virtually eliminates the requirement for a fitting rated in excess of 5000 pounds. For overall strength requirements, the floor should withstand a crushing load of 300 psi in flight and 1500 psi static; its capacity should be uniform at 200 pounds per square foot with no area limitations.

Overselling is the one-word description of American Airlines' cargo sales superintendent J. M. Glod for the unfounded enthusiasm of the 1940's which has materialized into a business growth only 20% of the billion-ton-miles forecast.

The public was oversold with delivery promises impossible to attain, and fantastically reduced rates were implied with the availability of new equipment and increasing volumes. Aircraft manufacturers and airline operators were oversold and made plans and commitments which turned out to be both costly and shocking when the money didn't roll in. It all added up to Glod's explanation for the "gun-shy" attitude toward air cargo in many quarters of industry today.

Today Glod estimates that American Airlines' air freight business for 1953 will pass the 50 million ton-mile mark, compared to slightly more than one million for 1945, its first full year.

Of AA's \$187 million in gross revenues in 1952, over \$10 million was received for air freight. By 1962 AA expects freight to account for a very substantial percentage of total revenues, notwithstanding an anticipated large increase in passenger income.

One of the major contributions to "selling" the air freight business has been the adoption by operators of a delivery policy around which to build service. At American this policy generally provides for delivery to points within 1500 miles the next day, and for more than 1500 miles the second day.

This general policy is then refined on the basis of actual flight schedules. Some stations more than 1500 miles apart may get next-day service, whereas others as little as 1000 miles distant, because of infrequent schedules, may only be sold second-day service.

On the top of Glod's list of measures which would speed today's air freight handling is simplification of tariffs. Tariff and shipping documents are just not conducive to fast receipt or delivery, he contends, and certainly not compatible with the airspeed of the plane carrying the freight. It was almost natural to follow the tariff practices of surface transportation when air freight was started, he pointed out, but there are habits which must now be overcome and can be overcome by intelligent and active cooperation between the people concerned.

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News Briefs

The value of North American Aviation's name is "not less than \$10,000,000" according to J. H. Kindelberger, chairman of the board, testifying in his firm's suit against North American Airlines for name infringement. It was brought out that the manufacturer had spent over \$3,000,000 in magazine and newspaper advertising between 1942 and 1952.

New president of the American Society of Mechanical Engineers is Lewis K. Sillcox, honorary vice chairman of the New York Air Brake Co.

George Beiser has joined the Transport Air Group, Inc., as a logistics consultant. Beiser was formerly technical assistant to Donald A. Quarles, Assistant Secretary of Defense for Research and Development.

Overseas assignments are slated for Martin Matador missiles early next year, according to Pentagon sources. USAF squadrons have been in training for two

years and will soon be shifted to Tactical Air Command units.

Crash of the Convair YF-102 on take-off during recent tests was due to power failure, according to preliminary AF statement on the accident.

Just over 50,000 planes have been delivered by North American Aviation. Number 50,001 was an AF F-100, current holder of the world speed record.

National Airlines resumed operations out of Newark Airport on December 1, for the first time since February, 1952.

American Airlines has signed a contract with the Port of New York Authority for over 3.3 million square feet of space at Idlewild. Rentals during the 22-year period of the contract will total some \$3.3 million.

Beech Aircraft land, buildings, and equipment is worth over \$20 million,

as compared with the \$4.8 million balance sheet figure, according to a survey conducted by the firm.

A good will tour of Latin America will be conducted by 15 USAF jets starting January 16, 1954. Included in the flight will be North American F-86F's, Republic F-84G's, Lockheed F-80's, and Lockheed T-33's.

The CAA has authorized issuance of crew member certificates for scheduled air carrier crew personnel operating between the U.S. and a foreign country, in lieu of passports for temporary admission to cities adjacent to the foreign airports.

Charles A. Lindbergh has been named recipient of the Daniel Guggenheim Award for 1953 for "pioneering achievements in flight and air navigation." Presentation will be made January 25 during IAS Honors Night Dinner.

Bendix Builds a Better cable clamp *the* AN3057B

Inexpensive • Efficient • Versatile

The new Bendix AN approved AN3057B cable clamp is now available. Engineered by Bendix to the highest quality standards, this cable clamp offers major design improvements. The clamping action is radial and completely eliminates wire strain and chafing by holding the wire bundle firmly in rubber. This clamp will accommodate a wide range of wire bundle sizes, but an even greater range can be handled through the use of the Bendix AN3420A accessory telescoping sleeve.

The new AN3057B cable clamp will also waterproof multi-conductor rubber covered cable on the rear of a connector, or where moisture-proof entrance through a bulkhead or into an equipment box is required.

This versatile clamp is a product of the Scintilla Magneto Division of Bendix Aviation Corporation and is a companion AN accessory to the world famous Bendix Scinflex line of electrical connectors. Write our Sales Department for details.

Outstanding Features

Neoprene gland.

Centered clamping action.

Increased close down.

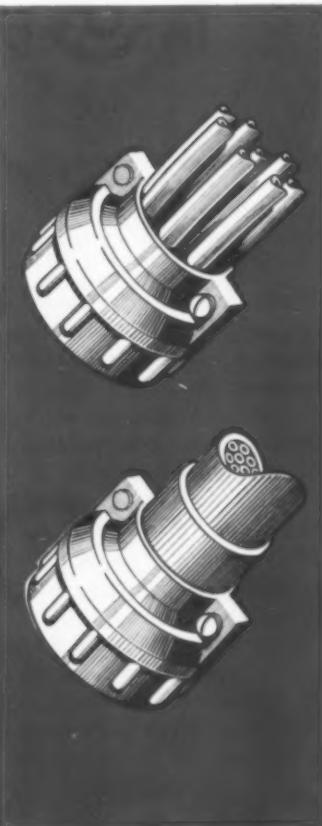
Positive grounding feature.

Cadmium plated die-cast aluminum nut.

Shorter over-all length.

Waterproof multi-conductor cable.

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Interview

With

Edgar Schmued

Vice President of Engineering

Northrop Aircraft, Inc.

• • •

The Role of the Long Range Interceptor

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Edgar Schmued, regarded as one of this country's foremost aircraft designers, became vice president in charge of engineering at Northrop Aircraft, Inc., in December, 1952.

Administration of all engineering and design activities on the F-89 Scorpion and on the company's guided missiles comes under his direction.

Before joining Northrop Schmued was assistant chief engineer in charge of design for North American Aviation, where he played a leading role in the designing of the F-51 Mustang, B-25, F-86 Sabre, and other military aircraft.

A native of Bavaria, Schmued began his aircraft career as a member of the technical staff of the Austrian Air Service during World War I and later was employed as a designer for Fokker aircraft in New Jersey immediately after his move to the U.S.

Q. What are the most acute problems in planning the defense of the northern polar corridor?

A. As I understand the Air Force's problem, the most acute problem is recognizing the enemy is coming. You need an early warning radar system and aerial defense units ready to defend your shores. It is important to know when enemy bombers are coming, how strong they are and what their targets are as early as possible. This means you must have an effective early warning radar system.

The polar region is not ideal for setting up an early warning system requiring a large number of people to operate and it would have to be established a long way from the U. S. In arctic weather it would be difficult to maintain. We would probably have to rely on a warning system that is much further inland.

This early warning system can be operated in several ways. One is the ground observer, another is the ground radar network, the third one is the radar network which is carried aloft by sentinel airplanes now in production.

Q. Do you subscribe to the theory that the northern polar region is probably the most vulnerable path of attack?

A. Not necessarily. I believe there is a good chance an attack might be launched from that area, but also it might come from northern Siberia. Certain targets in North America are just as easily reached by that route. We actually have to protect ourselves from three approaches: the polar approach, the eastern approach, and the western approach.

Arctic Use

Q. How does the F-89, some of which are going to Alaska, fit into the arctic defense plan?

A. It carries two men and has a radar installation, which permits it to fly all-weather missions, and it carries enough fuel to be valuable as a long-range defense weapon. It is very important to be able to reach out to meet the enemy and wear him down while he is coming in. You can often force the issue far enough out so that he has to use full power, which makes it impossible for him to reach his target. An abortive mission is just as good as no mission. The only airplane currently available for this type of interception is the F-89.

Q. Do you advocate two men for interceptors?

A. Yes I do, because modern all-weather airplanes are pretty complex and the pilots flying them have just a little bit too much on hand to be efficient. The efficiency is raised considerably if you have a two-man crew, one operator to handle the radar set while the other flies the plane. We moved in the right direction with this and it will prove an advantage in the future.

Q. When our pilots got into the MiG they discovered the airplane was a little difficult to fly and didn't leave much opportunity for the pilot to do anything else, didn't they?

A. That is right. People have been saying that we are overloading our airplanes. We do have heavy airplanes, but a lot of things a MiG pilot has to do are done fully automatically in our airplanes. We use our pilots more efficiently than the Russians do. If you divert the pilot's attention from the real job of fulfilling the mission by forcing him to hand-operate gadgets, he cannot effectively use his operating time in battle.

'The missile is just an airframe with . . . guidance'

Q. Does the F-89 have a longer range than the average interceptor?

A. Yes, it does. Most current interceptors are point interceptors, designed to protect a specific target. Our interceptor is a radius defense, or area defense interceptor. If you were to picture a number of targets lined up, the point interceptor has to protect each target specifically, while our airplane can defend the whole area because of its range.

Defense-wise, the Scorpion can go out earlier and intercept the bomber formation at a point considerably away from the target. Its chances of making a kill with one, two, or three passes are much better.

Q. Would you say that your type of interceptor may have a longer life than a point interceptor?

A. You could assume that. Right now there isn't too much in the missile field that could replace an area defense interceptor. We have some missiles that might replace the point interceptor.

Not Replaced by Missiles

Q. Is the anti-aircraft missile going to replace the point interceptor rather soon?

A. No, not in the near future. In airplanes you can fly many missions with one ship. With missiles, once you fire it you are committed. I don't want to underrate the value of missiles, but so far we have not replaced the long range interceptor with missiles.

Q. What is Northrop doing in the pilotless bomber field?

A. We have announced work on the B-62, also called the Snark.

Why So Long?

Q. Why does it take so long to develop a missile of this type?

A. Building a missile today is like giving the aircraft people the problem of building a 1930 model of an airplane in 1903. It took the Wright brothers a long time to develop their airplane. It wasn't that they didn't have the money or the manpower—they couldn't have used it. They had to go step by step because there was so little known about aviation. When you explore a new area you don't improve time simply by adding manpower. With all the money and manpower available you still couldn't have an appreciable acceleration in research and development because there are certain successive steps in development that must be attained.

It has actually taken comparatively little time for missile development. You assume that a bomber will become operational about five years after you start. We started designing missiles in 1946-47. After five years, we have got some flying, despite the fact that we opened up completely new fields, things that never have been done before. The industry has done a remarkable job.

Q. Do you think the guided missile belongs in the category of the aircraft industry?

A. Definitely. Ultimately, the missile is just an airframe with an automatic guidance system. There are some overlaps between aircraft and missiles—some fighters now being built will be taken off automatically, reach the target, fire their armament, and pull out, all automatically. The pilot doesn't have to touch anything. The plane turns around and is vectored home and flown in by the ground control.

We Unload the Pilot

Q. Is that the F-89E, F or G that you are talking about?

A. No, but there is no reason why we couldn't do it with the F-89; the equipment is on board the F-89. But since the Scorpion is a two man airplane we don't have to do that. On ground controlled airplanes the pilot is an emergency stand-by system—the most magnificent stand-by system anyone could devise. We unload the pilot by giving him a radar observer. Therefore, we have the benefit of having the best piece of machinery flying; you could never build a machine as good as the human brain.

Q. Can you tell me anything about your rumored long range, delta-wing interceptor?

A. No, I'm sorry, but military security shrouds our future designs. I wish I could show you some of them to better illustrate the value of our 10-year program here at Northrop. We are always looking ahead and developing new designs for the military services. We are committed to a design program geared to the Air Force's requirements 10 years from now.

Deltas Need Tails

Q. Do you favor the delta-wing design for an interceptor?

A. Yes, I do. But I firmly believe that any delta-wing aircraft must have a tail. This type of delta design, coupled with the right powerplants, would enable it to reach supersonic speeds and very high altitudes in a minimum length of time.

Q. Why do you place so much emphasis on a tail for the delta-wing airplane?

A. Because the tail must be present to give the airplane better transonic speed characteristics. It reduces the trim drag of the airplane, and consequently permits greater range. The tail also will give the airplane better low-speed handling characteristics.

Q. What are you at liberty to say about the range of the F-89?

A. We have demonstrated ability to fly nonstop approximately 2000 miles. With this range the airplane permits adequate area defense. This ability was demonstrated by its nonstop flight from Edwards AFB, California, to Dayton, Ohio.

Q. Can you say anything about how the F-89 has been altered and modified to extend its range?

'We design an airplane good for 10 years'

A. Yes, we have added pylon tanks under each wing, which considerably extend its radius. These are additional, droppable tanks.

Q. Do the F-89's have very high firepower?

A. They have the highest firepower of any U. S. fighter today. On the F-89D we have changed from cannon to rocket armament. The new Scorpion's 104 wing-tip rockets have a high kill probability for several passes, increasing the firepower tremendously.

Q. Will this added range give the F-89's a new role in continental defense?

A. It is not a new role. The Air Force wanted this type of airplane, so it was designed to fulfill the long range mission, and it does.

Q. Is area defense a new concept of defense?

A. Not exactly, but former methods are considerably improved by the type of weapons that are now available. It is much more important to intercept as early as possible. Today, in the age of atom and hydrogen bombs, if just one bomber gets through it may mean the ruin of a city. So the necessity of intercepting early and destroying the enemy before he comes within target range is much more important.

There must be much more emphasis on long range operations than there was previously. The defense concept has not changed, but the emphasis has.

Defense in Depth

Q. This has created a very large increase in the depth of defense?

A. Yes. That is why it becomes so much more important to be able seriously to interfere with the bomber formation before it reaches the target. Even a crippled bomber can close in and deliver if it is close to the target. So you really have to destroy it, and the Scorpion has the punch to do it.

Q. Is the so-called "wolf pack" technique of interception a complete departure from present aerial tactics?

A. Not a complete departure, but it again becomes more important. The F-89's can attack a large formation of bombers and fight them across hundreds of miles of sky. The "wolf pack" technique is to attack a large number of bombers with a small number of interceptors capable of repeated harassing attacks. It is important to have a definite plan when you go up to intercept the enemy. You must know which bomber you are going to attack. If the formation is known from radar they could assign each F-89 to a specific target for the initial strike.

No Bomber Too Big

There isn't a bomber big enough now that the F-89 can't shoot it down. The bigger the target is the more hits you can get.

Q. Do you think that the rockets on the F-89 are the ultimate in firepower?

A. Not necessarily.

Q. Would guided missiles be an improvement?

A. Perhaps, but I am not at liberty to say how they might improve the situation.

Q. Does the F-89, in addition to the range and the firepower, have any other characteristics especially suited to air defense?

A. It has beautiful handling characteristics, tremendous firepower, long range, a full-power control system, and other unique features. It is the only existing area interceptor designed specifically for the all-weather mission.

Q. What about the F-89's capabilities for effective cold weather operation?

A. Recent tests have proved the F-89's anti-icing system to be extremely effective. This is very important on arctic missions. In addition, the Scorpion has twin engine reliability.

Effect of Weapons System

Q. In a general way, do you think the new so-called weapons system will give you more or less design efficiency?

A. It will improve design and result in better weapons systems.

Q. You think it might improve producibility too?

A. Since producibility is simply applying know-how that you have to a device that you want to build, the weapons system does not necessarily improve it.

Q. I suppose it might cut some lead time?

A. Yes, although that does not necessarily imply the manufacturer will build everything on the airplane. We expect some gains in being able to deal directly with the accessory manufacturer as far as saving time and probably also in quality, since it will be designed for a specific demand.

10-Year Program

Q. What can the aircraft designer do to lower the costs of the airplane?

A. The airplane designer can have some influence over costs by planning a long way ahead to foresee what the airplane might look like in 10 years and incorporating all the features in the design that a 10-year plan would require. I think we are the only company that has definite plans based on a 10-year program for any airplane we are designing.

Q. In other words, if you were starting the design of a new airplane today, you would take into consideration a great many possible growth factors?

A. Yes. This was a big selling point for a new program which we have right now. This is a really outstanding contribution that Northrop can make. Instead of giving lip service to it, we are going to do it. Sizeable cost reductions can only be made by careful planning and anticipating what you might have to incorporate in a design for future years. We design an airplane good for 10 years and prove it.

This will eliminate the procurement of a new fighter every three years. Your first fighter will cost just a trifle more, but from then on you save considerably in cost because you don't have to re-train people or change your procurement methods.

If we know that in 1963 we'll want a wing of a certain thickness, we build it now for that thickness. By esti-

Light weight fighter: 'It isn't night all the time'

mating the speed of an airplane in 1963 with the engines that might be built in 1963, we can design for that growth right now. After a few years you can put the new engine in it and add some equipment by making a few simple field changes. This will ultimately result in sizeable savings.

The cost of an airplane is only about 15% to 18% of the cost of operating it. So if you don't change the type of a series, you can realize a big operational savings. Such savings would amount to hundreds of millions of dollars just in the procurement of airplanes and billions in the operation.

Q. Can you enter an ordinary Air Force competition for a new type of airplane on that basis?

A. No, because it will necessarily have to show that the first series costs a little more. However, this will amount to almost nothing over a 10-year period. The Air Force has expressed considerable interest in this plan.

Q. When you say a 10-year plan, do you mean really 10 years?

A. Yes, 10 years operational life. This is one way of pushing off the obsolescence of a model and getting a long operational life out of it.

Not Easy with Missiles

Q. Might you carry the same philosophy over to the guided missile field?

A. Yes, we have already tried it and it works just as well. Although it is not quite as easy because the state of the art is too young. We don't know what kind of changes are coming and the prediction of growth curves is not as easy.

Q. How can this 10-year plan be most helpful?

A. Particularly in engine changeover. We know for instance that five different engines will be developed over the next eight- to ten-year period. We provide for field attachments for all these engines right in the basic airplane. So if the Air Force decides today we should use one engine and later decides a newer model is better, all they have to do is send the new engine out and in two days we can make the changeover.

Q. When you design an airplane you are designing it around an engine which is promised but hasn't been delivered?

A. That is why it is an advantage to design it for five different engines, any one of which can be put on the airplane. If for any reason one engine drops out of the picture we pick a different one. We could have an engine that gives us a Mach number of 1.6, another one may give us a Mach number of 2, so we design the airplanes and everything that goes into it for the ultimate Mach number. We assure the Air Force of a long range program that is substantial and reliable.

Q. If you design for 10 years ahead, won't your airplane be inefficient during the first nine?

A. No, it won't. It will actually result in a slightly faster airplane because the aerodynamical requirements on

the early models would be superior to what you would need for the early engines. The only place where you might suffer a little bit is the initial cost. But for the extra cost that we put into this airplane we would have a gain in Mach number of about .05 to .10. In the long run it would save millions and millions of dollars.

Light Weight Fighter

Q. Although the F-89 is a relatively heavy airplane, it has been rather widely believed that you are an advocate of a light weight fighter, that is, a day fighter?

A. Yes, for a short range air-superiority fighter I am a proponent of the very lightest and simplest that we can build. There are two categories which I favor—a long range concept in an airplane sufficiently substantial to do the mission and the lightest and cheapest airplane you can build for limited missions. After all, it isn't bad weather every day and it isn't night all the time.

Now when I say light weight don't get me wrong; this is not a stripped fighter. It has no gadgets missing that the pilot needs. It does not mean taking something out of an existing fighter and throwing it away.

Q. Do you feel that Northrop might try to get back into the bomber field?

A. There is nothing we wouldn't take on, but I believe the Air Force has very definite ideas about this. They feel there are certain factories that are better suited for certain types of airplanes. You can easily see that our factory, due to the space requirements and so on, could not take on large bomber construction as efficiently as a medium- or small-size airplane.

Use What We Have

We are also getting to the point where we have to use what we have instead of spending additional government money on new facilities. I think we should possibly build the thing that we know we can build best, like the F-89 and light weight fighter aircraft.

Q. Do you think your guided missile activities will be expanded?

A. I hope so. We feel that missiles are here to stay, and our missile program has a high priority rating among our projects.

Q. Is there any chance that Northrop will revive interest in the Flying Wing?

A. No, we have no intention of reviving it.

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We
already
live in the
world of
tomorrow!



Unbelievable, but true—

- Before long, an arrival on the moon will be recorded like a "live" TV show
- A fur-bearing animal which survived a rocket-ride into "weightlessness" can be killed instantly by the noise of a twin-jet
- With the aid of in-take windows and a bin of salt you can run your house the year-round on a thermostat
- By 1970 you will take pictures in utter darkness
- In five years you can have a walkie-talkie wristwatch — just like Dick Tracy
- We could light up the night sky—and an enemy target—by sending up rockets loaded with salt
- You will soon pick up your hat, briefcase, umbrella and your one-man collapsible helicopter to go to the office in the morning

Fantastic? No, factual; and only some of the astonishing but highly possible achievements as we rush towards the gateway of a new human existence in —

Tomorrow's Air Age

A REPORT ON THE
FORESEEABLE FUTURE

By HOLMES ALEXANDER

WRITTEN with the full cooperation of the Air Force Research laboratories, this is a leading reporter's fascinating glimpse into the foreseeable air-age, with its incredible possibilities and almost equally incredible problems: "Weightlessness," unendurable to the human being . . . Noise, which can flatten a building . . . Altitude, that fries and freezes a hand in the same instant . . . And—most of all — man himself, consciously air-minded, psychologically earth-bound. A lively, absorbing and highly readable account of what lies just around the corner of time!

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Non-Skeds Face Critical Year in '54

Time of troubles hits irregulars as railroads put on pressure and military charters dwindle.

By WILLIAM V. HENZEY

EARLY 1954 is shaping up as the most serious period in the seven-year history of the non-scheduled airline industry. Far removed from CAB enforcement actions and the omnibus investigation still going on in Los Angeles are these major developments which could cripple a substantial part of the non-scheduled industry inside of a few months:

- Severe pressure from the railroads which, through cut-rate bids for military business and propaganda campaigns aimed at the safety level of irregulars' flights, have already cut sharply into the airlines' revenues.
- A new Defense Department policy which indicates there is no longer a military necessity for a blanket exemption for unlimited non-scheduled airline flights, plus the possibility that CAB may permit such exemption to expire January 15, 1954.

• An open split between the two associations which represent the non-scheduled industry primarily—Aircoach Transport Association and Independent Military Air Transport Association.

• Possible ruling out of the C-46 for passenger operations after March 31, 1954.

• A decline in commercial low-fare or tourist business.

The railroad pressure, according to rail officials, is a determined effort to recoup military contract business once predominantly theirs, but lost to the airlines during the Korean War. From one angle, the rails started hitting the "lack of safety" in non-scheduled airline operations with C-46 aircraft. Speeches, letters to Congress, and other media were used to stimulate distrust of the irregular service.

From another, and perhaps more effective angle, the railroads invoked a long dormant section of the Interstate Commerce Act to bid for military business at rates under filed tariff rates. Such rates are known as "Section 22" rates, in reference to the section of the Act which provides that "nothing in the Act shall prevent the transportation of persons for the Government at free or reduced rates."

According to the non-scheduled lines, the rate pressure began about October 1, 1953. It has increased in intensity. Normally, bids to the military range about 10% below standard com-

mercial fares. The non-skeds claim railroads are bidding "anywhere from 25% to 45%" below their established tariffs for civilians.

For the non-scheduled lines, military business admittedly has been "a substantial part" of their business. They can't compete on a rate basis with the new railroad bids and thus are losing large shares of this business.

Meanwhile the Defense Department as this issue went to press was reported by reliable sources to have adopted a policy that would knock an economic prop out from under the large irregular air industry. The policy, in effect, would state that there is no longer a military emergency requiring CAB to exempt non-scheduled lines from usual "frequency and regularity" conditions.

Since the start of the Korean War the CAB has issued a blanket exemption, not only to non-skeds, but to certificated carriers as well, authorizing unlimited military contract operations. Basis for such an exemption has been the Defense Department policy that a military emergency required it.

May Be Revoked

Now, with that policy being switched, CAB may revoke the exemption. The latest such exemption was to have expired December 1, 1953. CAB, with only unofficial knowledge of the new Defense policy, extended the exemption for 45 days "pending receipt of additional data." Thus January 15, 1954, becomes another deadline in what one non-scheduled airline official terms "an existence of deadlines."

Still another date to be met by the carriers is the March 31, 1954, cut-off date for the so-called "interim standards" under which C-46 aircraft are now used in passenger operations.

Originally the transport category requirements of the Civil Air Regulations were to have applied to C-46's beginning January 1, 1954. If CAB had not extended the date for three months, the C-46 might well have been ruled out of passenger service on New Year's Day. CAA experts claims various modifications have to be made before the plane can conform to the transport category requirements.

The C-46 has no manufacturer standing behind it. But the non-scheduled lines some time ago formed the Aircraft Engineering Foundation, which

has been engaged in tests designed to "improve performance and the general safety of operation of C-46's."

The AEF requested CAB to extend application of transport category requirements for six months beyond January 1. CAB granted only a three-month extension. Even if the AEF tests prove that certain modifications in the C-46 can satisfy the transport requirements, there is a question of whether the operators can afford to make the necessary changes. Estimates of the cost for each plane range from \$10,000 to \$100,000.

Also, many of the 74 C-46's that non-scheduled lines operate are under lease from the Air Force and are thus recallable on short notice. There is consequently an understandable hesitancy on the part of some operators to invest heavily in modifications.

Possible Solution

One possible solution is that the AF might sell the C-46's to the operators with the modification costs absorbed in the sale price. The answer on this should come before March 31.

On another front, the carriers are warring among themselves. Their two associations—ACTA and IMATA—once on the brink of merging, have completely severed relations under which they operated a "joint control board" for the procurement of military contract business. Recently ACTA wooed three of IMATA's member carriers away from it. The break may grow deeper in the next few weeks.

Finally, what the non-scheduled lines relied on before military contract business became such a major part of their economic lives—commercial revenues—may have disappeared or have been diverted to such an extent that they cannot be relied on as a cushion for rougher days.

Scheduled lines with comparable fares but with larger and faster equipment, and more of it, are in the low-fare tourist market in a big business way. Even they report declining tourist business. It may be a seasonal decline or it may be an economic trend, but the fact remains that ample scheduled tourist service is available on most routes familiar to the non-scheduled carriers.

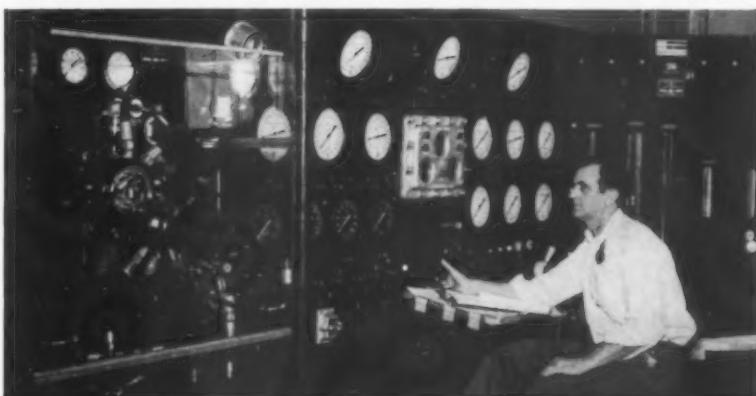
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GREER TOPICS

Important News of Aviation
& Industrial Test Equipment



Pratt & Whitney Aircraft tests Holley fuel control with test stand shown above. This like other equipment on this page, was designed and built to order by Greer Hydraulics in close collaboration with Pratt & Whitney Aircraft and Greer's special staff.



To test fuel pressurizing valves, Pratt & Whitney Aircraft uses test stand above, designed and built by Greer to Pratt & Whitney specifications. In addition to this designed-to-order equipment, Greer produces an entire line of standard test machines.



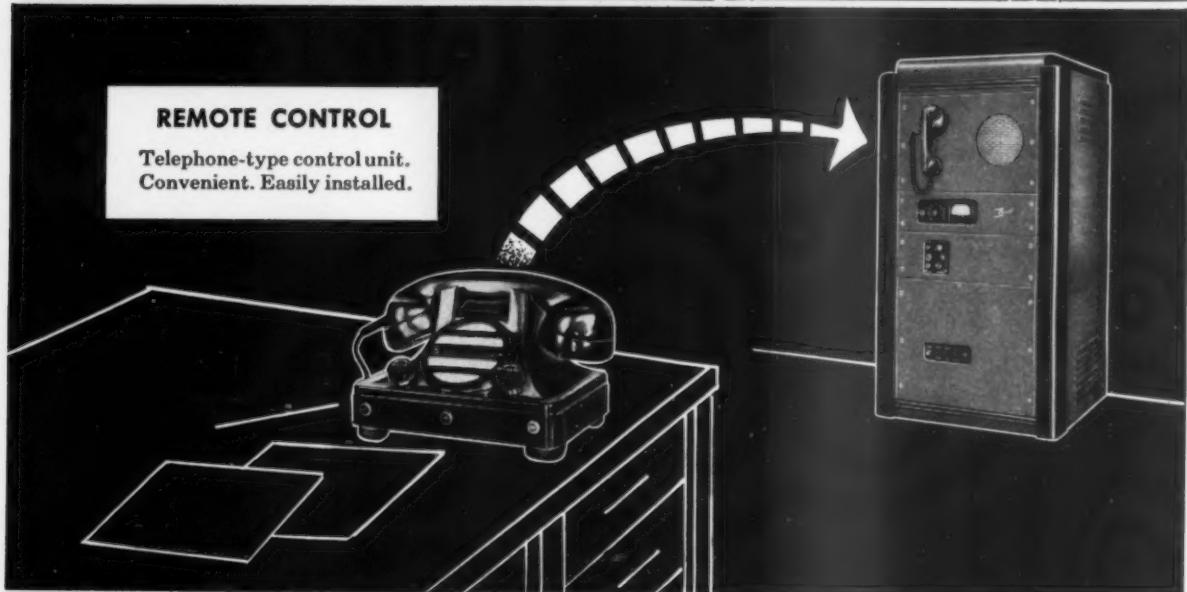
After-burner fuel control is checked on this Greer test stand. Aircraft manufacturers like Pratt & Whitney Aircraft know that Greer equipment means highest order accuracy and dependability. The stands are designed and built by men with many years of experience in this very specialized field. Call or write Greer today to help solve your test and maintenance problems.



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RECEIVER SPECIFICATIONS

FREQUENCY RANGE: 118 mc to 136 mc (by changing one fixed capacitor frequency range can be increased to 152 mc.)

SENSITIVITY: Less than 2.5 hard microvolts is required for 6db S +N/N ratio with 30% modulation at 100 cps.

FREQUENCY STABILITY: 0.005% from -25°C to +55°C.

BANDWIDTH: ± 20 kc at -6db attenuation
 ± 45 kc at -100db attenuation

SPURIOUS RESPONSE: Greater than -90db.

AUDIO RESPONSE: Less than 3db variation from 300 to 3500 cps.

AVC CHARACTERISTICS: 3db variation with input varied from 5 to 100,000 microvolts for one watt output.

NOISE LIMITER: Audio output variation not more than 2db from 70% modulation to 100% modulation.

SQUELCH: Range 0 to 50 microvolts. On-off differential at 2 microvolts input level, 0.3 microvolts.

TEMPERATURE RANGE: -25°C to +55°C.

HUMIDITY RANGE: 0 to 95% at 50°C.

PRIMARY POWER: 117 volts, 50/60-cycles ac, approximately 85 volt-amperes.

AUDIO OUTPUT IMPEDANCE: 600-150-4 ohms.

R-F INPUT IMPEDANCE: 52-ohm coaxial with maximum standing wave ratio of 2 to 1 from 118 to 136 mc.

TRANSMITTER SPECIFICATIONS

FREQUENCY RANGE: 108 mc to 136 mc.

POWER OUTPUT: 50 watts unmodulated.

EMISSION: A3 (A.M. Telephony)

OUTPUT CIRCUIT: To feed 52 ohm coaxial cable. Complete with antenna co-ax relay (send/rec.) installed.

MODULATION CAPABILITY: 95% at 1000 cps.

NUMBER OF CHANNELS: One. Can add crystal relay to give two channel operation. Second channel less than 800 kc away.

FREQUENCY STABILITY: 0.005% from -25°C to +55°C.

AUDIO INPUT: 500 ohm center tap or carbon mic. Minimum level approximately -15db into 500-ohm input.

AUDIO RESPONSE: Within 6db from 300 to 4000 cycles.

DISTORTION: 10% maximum at 95% modulation level (1000 cycles.)

NOISE LEVEL: 40db below 95% modulation with 60-cycle supply.

INPUT POWER: 117 volts, 50/60-cycles ac.

STANDBY: 80 watts.

FULL OUTPUT
(95% modulation): 380 watts.

TEMPERATURE RANGE: With 866 mercury tubes 20°C to 55°C.

With 3B25 gas tubes -25°C to +55°C.

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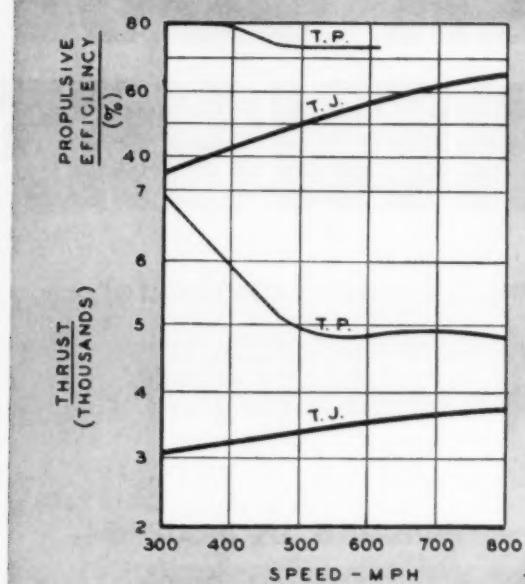
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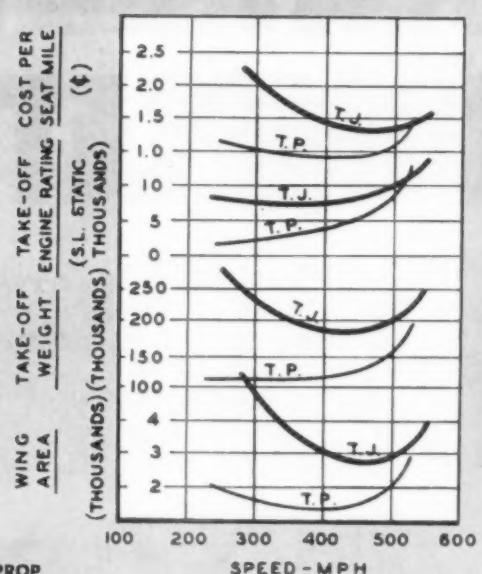
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TURBOPROP-TURBOJET COMPARISON



T.P. = TURBOPROP
T.J. = TURBOJET



TURBOPROP is 20% more efficient at 450-550 mph than pure jet, P&W engineer estimates.

Don't Sell the Turboprop Short, Warns P & W

Sixty ton payload carried at three cents per ton-mile foreseen; possibilities still undeveloped.

By WILLIAM D. PERREAULT

USING the joint meeting of the Washington and Hagerstown sections of The Institute of the Aeronautical Sciences as a sounding board, Pratt & Whitney's Donald S. Conrad recently made some rosy predictions for the turboprop-powered transport of the future:

"Above all, we should not sell the propeller-turbine engine short. It has untouched possibilities which are latent, not because they are not recognized, but because they have not yet been developed.

"A cargo transport with four turboprops in the ten thousand equivalent shaft horsepower class should be able to transport 50 tons (of cargo) at less than four cents a ton-mile. Some day a fifteen thousand equivalent shaft horsepower turboprop-powered cargo carrier will be able to transport a 60 ton payload for a direct cost of three cents a mile.

"Ultimately we can expect a twenty to twenty-five thousand equivalent shaft horsepower propeller turbine engine to

carry 75 tons at a direct operating cost of less than three cents a ton-mile. These are reasonable goals that can in the future allow us to carry considerable goods from coast to coast in one eight-hour working day."

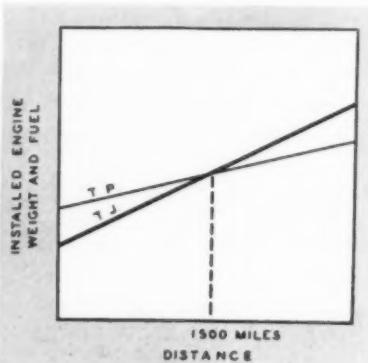
For comparative purposes Conrad cited the Douglas DC-4 as carrying about six tons at a direct operating cost

of 10¢ per ton-mile, the DC-6A carrying 14 tons at six cents a ton-mile, and the C-124 carrying 35 tons at a DOC of four to five cents per ton-mile.

Conrad emphasized that the turboprop's capabilities are largely unproved, that the transport powered by this type of engine will cruise about 100 miles per hour slower than an economical turbojet aircraft, that the weight of the turboprop plus its propeller is about 50% more than the turbojet, and that at some of the higher speeds quoted for turboprop transports the cost equals or exceeds jet costs.

To balance this the turboprop engine is about 20% more efficient at 450-550 mph than the pure jet. This is the result of the big propeller moving a much larger volume of air at a slower speed than the turbojet. This is an inherent advantage. Higher efficiency plus the greater static thrust of the turboprop engine make it possible to use high wing loadings, smaller wings, and a smaller aircraft. Lower fuel consumption is also a major contribution toward this end.

With these points in mind, Conrad presented some tables which highlight the advantages and disadvantages of each type powerplant in the speed range of the next round of transport aircraft. A look at these tables and charts shows



WEIGHT OF FUEL and engine installation puts cross-over point at 1500 miles in chart above.

that "the most economical speed for the turboprop is 400 miles per hour, and for the turbojet, 480 miles per hour . . . A change in assumptions might raise the speeds slightly, but without significant changes in the relative cost levels."

Translated to cost per passenger-mile (per 200 pounds), all this means that at 520 miles per hour the turboprop and turbojet aircraft are about the same, in this case 1.45¢. Below this level the turboprop is much more economical, reaching values as low as 1.05¢ at 400 mph, 1.1¢ at 450 mph, 1.25¢ at 500 mph.

By comparison, an equivalent turbojet—a 75-passenger ship operating over 2600 miles nonstop with 25,000 pounds payload—costs 1.45¢ per passenger-mile at 400 mph, 1.35¢ at 450 mph, 1.40¢ at 500, and 1.65¢ at 550 mph.

Basic Fact

This highlights a basic fact. While it is generally agreed that the high speed capabilities of the turbojet are greater than those of the turbopropeller, this does not mean that a propeller-driven airframe theoretically cannot go as fast as a jet. It can, but the resulting engine size and weight makes this an uneconomical or inefficient way of accomplishing very high speeds. The turboprop cost may, however, run 10% to 20% less than the turbojet on a seat-mile basis, at lower cruising speeds."

Conrad's paper is of considerable interest for the information it provides regarding engine requirements to match some of these transport speeds and weights. He spoke of a turboprop that would be a split compressor engine operating with a compression ratio of 10-12 to 1 and cruising at 35,000 feet altitude.

The turboprop has a specific weight of 0.45 pounds per equivalent shaft horsepower plus 0.2 pounds for the propeller per eshp. Installation requirements raise this to 1.5 pounds per pound of engine dry weight, minus the propeller.

By comparison the turbojet would weigh 0.4 pounds per pound of static thrust and installed weight would run 1.25 pounds per pound of engine dry weight.

These weight figures, plus those on fuel consumption, determine the cross-over points of the turboprop and turbojet transports: "At 400 mph, the turbojet engine plus fuel weight is nearly twice that of the turboprop engine and its fuel requirements; at 500 mph, the turbojet engine plus fuel is only about one-third more than that needed for the turboprop engine plus fuel."

Turboprop vs Turbojet

	TURBOPROP				TURBOJET				
Speed (mph)	400	450	500	520	400	450	500	520	550
Installed eng. wt.	16000	21000	31500	43100	15000	17000	20000	23000	28000
Fuel flow (#/hr.)	3800	4300	5600	7600	8500	9200	11000	12500	15600
Block time	7.0	6.3	5.7	5.5	7.0	6.3	5.7	5.5	5.25
Total fuel wt.	26500	27200	32000	42000	59500	58000	63000	70000	82000
Eng. + fuel wt.	42500	48200	63500	85100	74500	75000	83000	93000	110000

	TURBOPROP				TURBOJET				
Speed (mph)	400	450	500	520	400	450	500	520	550
Mach No.	.605	.68	.76	.785	.605	.68	.76	.785	.83
Operating L/D	16.0	16.0	16.0	15.8	18.0	17.5	16.5	15.9	15.0
Thrust (#/eng.)	1800	1960	2340	3100	2410	2550	2950	3300	4100
S. L. static rating	4500	6000	9000	12000	7500#	8500#	10000#	11500#	14000#
Engine wt.	2050	2700	4050	5400	3000	3400	4000	4600	5600
Prop. wt.	900	1200	1800	2400	—	—	—	—	—
Total wt. (lbs.)	2950	3900	5850	7800	3000	3400	4000	4600	5600

	TURBOPROP				TURBOJET				
Speed (mph)	400	450	500	520	400	450	500	520	550
T-O gross weight	115000	125000	150000	195000	182000	178000	195000	210000	245000
Wing area	1300	1500	2050	2900	2900	2600	2700	2900	3500
W/S	.88	.83	.73	.68	.63	.68	.72	.72	.70
T-O eng. rating/eng.	4200	6000	9000	12000	7500#	8500#	10000#	11500#	14000#
Cost per 200 lbs.	1.05¢	1.1¢	1.25¢	1.45¢	1.45¢	1.35¢	1.40¢	1.45¢	1.65¢
Cost per hr. (\$)	465	550	700	840	650	675	780	840	1020

"The passenger appeal of speed appears to favor the turbojet-powered airplane. In addition to providing higher speed transportation, the turbine engine, because of its vibration characteristics, offers a new kind of comfort to the air traveler. This is probably of greater benefit with the turbojet than with the turboprop. We have seen in the earlier comparison that the turbojet is more economical at speeds above approximately 500 mph. Thus, I believe these characteristics favor the turbojet more than the turboprop engine types.

Propeller Problems

"The addition of a propeller increases the problems connected with noise and vibration. These problems in a turboprop installation are not insurmountable but tend to increase the airframe weight. Thus, both types of turbine engine can improve passenger comfort in flight, with a slight edge for the turbojet over the turboprop."

"The decision as to which type of engine will be used is up to the passenger, as represented by his demand for economy or speed." ***

Airlines Crowd RR's in Passenger Revenues

Airlines will be four of the first five top passenger carriers in the U. S. for 1953, according to a United Air Lines estimate based on passenger revenue rankings. American Airlines is expected to take first place, followed by United Air Lines, which replaces the Pennsylvania Railroad in second place. UAL placed third in 1952.

The survey predicts that Eastern will take fourth place, with TWA fifth, and Capital moving into tenth spot, nosing out the Long Island Railroad.

Review Reserve Plants

Members of the National Industrial Reserve Review Committee have begun a review to determine the present and future needs for 165 plants, of which 29 are used for aircraft production. The facilities, all of which were built by the government, are now either sold to industry with recapture rights in case of emergency (103), under lease to commercial companies (42), or inactive (20).

1929 In covered cockpit of his Consolidated NY-2, Jimmy Doolittle, using Sperry Gyro-Horizon and Directional Gyro, takes off from Mitchel Field, flies over 15 miles, and lands safely—accomplishing the first complete "blind" flight in history. Lieutenant Ben Kelsey acts as check pilot.



BLIND



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FLYING... another Sperry first... 1929

"Blind" flying has an interesting history. For years many people had flown "blind" on occasion through clouds. And in 1926, William C. Ocker proved man's physiological inability to fly "blind" without instruments. His experiments, based on the Sperry-developed Turn and Bank Indicator, helped pilots understand and use flight instruments.

The era of dependable all-weather flying did not begin, however, until Lieutenant "Jimmy" Doolittle made his historic "blind" flight in 1929. With the aid of two new Sperry instruments, he opened the door to dependable all-weather flying. From then on a pilot had an *artificial horizon* on his instrument panel—a horizon that couldn't be blotted out by fog or darkness. And a *gyroscopic directional indicator* assured him of a precise course under all conditions, unaffected by magnetic disturbances.

TODAY, AS THEN, SPERRY LEADS THE WAY

Twenty-four years have passed since the Doolittle flight. In those years Sperry has pioneered in development after development, utilizing electronics to make earlier instruments more precise, and to provide still greater mastery of the elements. With the Sperry Zero Reader* Flight Director, for example, military pilots now manually fly and navigate at supersonic speeds with accuracy and precision approaching that of automatic flight—and, with Sperry armament, intercept and destroy enemy aircraft unseen by human eyes. The Flight Director is widely specified for passenger planes and executive aircraft as well as for military use.

*T. M. REG. U. S. PAT. OFF.

1941-45

Sperry flight instruments enable U. S. Navy and Marine fliers to operate from deck of carrier, carry out missions and return—often in total darkness. Also, airborne radar helps pilots to seek out enemy aircraft and submarines.



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One of a series of advertisements commemorating the Fiftieth Anniversary of Powered Flight.



1932 Captain A. F. Hegenberger in his Douglas BT-2A makes first solo "blind" flight and landing at Wright Field, Dayton, Ohio, using Sperry Gyro-Horizon and Directional Gyro. This flight was significant in proving a system of "blind" flying and landing and resulted in Captain Hegenberger's winning the Collier Trophy.



1936 Air Corps Major Ira Eaker, left, makes the first transcontinental "blind" flight—and alone—from New York to Los Angeles. His Boeing pursuit ship is equipped with Sperry Gyro-Horizon and Directional Gyro. Major William E. Kepner pilots escort plane.



1953 Sperry Zero Reader Flight Director gives military pilots new manual control that approaches automatic control in ease of operation and precision. In conjunction with radar, the Flight Director aids interception at very high altitudes, day or night.



New Planes and Policies Put . . .



... New Life in 'Flying Houseparties'

By KEITH SAUNDERS

WHEN Walter Sternberg accepted the presidency of Resort Airlines early last summer, he set himself two primary goals:

* To develop to the fullest the great traffic potential he believed inherent in a certificated air cruise operation in the Caribbean vacation-land;

- To bring about a full acceptance of Resort Airlines as being complementary to the scheduled domestic airlines.

Although he has headed the cruise carrier for only a few months, Sternberg, former vice president of sales for National Airlines, is moving steadily toward attainment of both these goals in the foreseeable future. Steps he has taken in recent weeks include:

- Purchase of three DC-4's from National Airlines for complete replacement of C-46's in scheduled cruise operations.

* Announcement of winter schedules (effective December 19) offering a total of 17 attractive cruises and 1700 available seats weekly, as against six cruises and 240 seats per week last winter.

• A series of meetings for the purpose of telling Resort's new story to travel agents, travel editors, and airline sales officials in 21 eastern and mid-western cities.

- Launching of a major (for Resort) advertising campaign in aviation and travel publications and in principal newspapers.

Sternberg's sales "pitch" to the airlines is simply this:

"Resort sells nothing but Flying Houseparties—conducted, all-expense air cruises—a business which, because of various considerations, you common carrier airlines have never developed to any appreciable extent.

"Resort is not competitive with any domestic scheduled airline. Fourteen of our winter cruises will originate in

Miami, and we encourage the scores of travel agents who represent us to 'feed' our passengers into Miami via whatever scheduled airline or combination of air lines can give them the best connection with our departures. The three Reson cruises each week originating in New York and stopping at Philadelphia and Washington en route to Miami are 'insurance' flights—operated for the essential purpose of avoiding possible bottlenecks and enabling us to guarantee passengers from the populous New England and Middle Atlantic regions that they will have space to Miami gateway for our cruises, even during the busiest season on the New York-Miami air route."

Detailing how Resort's service complements that of the domestic scheduled carriers, Sternberg continues:

"Many individuals going outside the country prefer an escorted tour because of (1) uncertainties about local languages, currencies, et cetera, or (2) not wanting to be bothered with details of arranging transportation, hotel reservations, baggage handling, and other travel details.

Previously Steamships

"But before Resort came along virtually all such cruises were via steamships, which meant that passengers thought in terms of steamer trunks and accordingly traveled to port of departure via train rather than air. Resort's cruises, on the other hand, prompt passengers to think in terms of airplane luggage and air travel, and this stimulates business for all airlines serving or having connections to Miami.

Sternberg also points out that the "houseparty atmosphere" and special in-flight services provided by Resort effectively sell a lot of people on the desirability of traveling by air. Also, he notes, many Resort passengers find some particular place on their cruise itinerary of special appeal and when they return at some later date their point-to-point transportation will be via the other scheduled airlines."

"All in all," says the Resort official, "we think we are deserving of a niche in the air transport industry as a cruise operator whose business is decidedly complementary to the scheduled common carrier airlines."

Sternberg's story to the travel agents is equally simple and equally appealing. Basically, it is this:

Resort does not have a sales force of its own; it uses the travel agent almost exclusively. Resort cruises are easy to sell—they offer visits to a maximum number of distinctive overseas vacation areas in a minimum of time and at a moderate expense. In addition:

• One call does it all: the agent calls Resort and the carrier makes all the necessary cruise arrangements;

- One price includes everything except money for shopping and tips;
- One ticket is issued. The Resort ticket covers the entire one-week or two-week tour;

- 10% commission is paid, which is more than agents get on most overseas air travel;

- Resort's newspaper advertising always directs prospects to "see your travel agent";

- Resort's cruise manager in effect adds a new man to the travel agent's staff, handling all bothersome details and on-the-spot problems and thereby helping secure customer satisfaction and repeat business;

- There is no question as to availability of rooms for Resort's passengers because Resort retains blocks of rooms in the best hotels, regardless of season, on a year-round basis at many of the Caribbean area's most famous hotels.

These inducements, plus the wide variety of tours and prices offered, should spur travel agents to make an extra effort to sell Resort cruises, Sternberg feels.

One of the major problems which faced Sternberg when he went with Resort was that of equipment. All its planes were war surplus twin-engine Curtiss C-46's, and this plane, while having many advantages for operators, had been acquiring a reputation that made it less than desirable from the public acceptance standpoint.

After giving much thought to the many possible alternatives, including one transport built in another country, Resort's management decided the Douglas DC-4 would best meet its needs. Primarily, it was well within Resort's reasonable financing capabilities, and it had a good safety record and adequate capacity.

Furthermore, Sternberg explained, the DC-4's lack of pressurization and its relatively low speed (as compared to the DC-6 and the Super Constellation) would be no drawback at all to the cruise carrier.

"We want to fly low," he said, "so that our passengers can enjoy 'flightseeing' and picture-taking as we fly over points of scenic and historic interest. That is one of the appeals of our cruises; we don't fly above the clouds and out of sight of the earth. In fact, we will even go 20 or 30 miles off a straight air course in order to give passengers a look at some such attraction as the Citadel in Haiti.

"After all," he added, "our passengers are in no hurry to reach a business appointment or make a connection with another carrier. They're along for fun, a definite part of which is an interesting flight, as contrasted with a faster but dull and uneventful one. Also, distances on our inter-island hops are generally such that speed is not really of the essence. All of this adds up, in our opinion, to the DC-4 being the airplane we need."

By using one DC-4 to transport several different groups of cruise passengers between several different pairs of points on the same day, Resort estimates it should obtain eight to nine hours' daily utilization, which Sternberg feels should be sufficient in the light of the carrier's relatively low ratio of indirect to direct operating costs. Two of the planes will be used in flying the winter cruise schedules and the third as a maintenance reserve and for extra section operations in peak periods.

On the management side Resort is fortunate in that its board chairman, Clinton H. Davidson, Jr., has had considerable experience in management of investments. Several years ago, while president of Fiduciary Management, Inc., in New York, he heard about the Resort Airlines concept and was interested to the extent that he bought into the company "in a small way" shortly after it got its CAB certificate in August, 1949.

Davidson subsequently increased his holdings until, about a year ago, he acquired all the stock interest of R. Paul Weesner's Nationwide Air Transport Service, Inc., and became principal stockholder with over 75% of Resort's more than 8,000,000 shares.

Further purchases this year have upped his interest to over 85%, while holdings comprise 99% of the management firm's total investments. Fiduciary's Delaware charter recently was re-issued in the name of Resort Airlines, Inc., and amended to authorize it to engage in general transportation, thus



RESORT PRESIDENT Walter Sternberg (left) goes over plans with Clinton Davidson, Jr., chairman of the board of directors.

DECEMBER 21, 1953



PAL
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paving the way for the airline itself (now operating under a North Carolina charter) to become a Delaware corporation.

After Resort earned \$783,758 (after taxes) in 1951, Davidson unhesitatingly embarked on a program of expanding capacity and developing new markets, with the result that the company took a loss of over \$400,000 last year. This, however, did not deter him from approving the C-46 replacement program and this winter's expansion of capacity and schedules, for he is convinced that Resort is on a sound footing now and

is about ready to move into the blue chips.

At the end of 1952, Clinton Davidson took over from Weesner the job of president, while still remaining board chairman. Then it was that he began to look around for a man to take over the former post, freeing him to devote his attention primarily to the fiscal side of the business. He sought a man with the combined qualities of an experienced executive, a top-notch salesman, and a solid airline background. He found such an individual in Walter Sternberg, whom he hired away from National last June.



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Starting with Eastern Air Lines in 1930, Sternberg early displayed a marked ability as a salesman with both drive and vision, and he steadily rose to become general traffic and sales manager. Later, as assistant vice president of sales for American Airlines, he played a prominent part in starting the family fare plan. Later, while with National Airlines, he worked up the "piggy bank vacation" plan for spurring summer travel to Florida.

Idea from SAS

Sternberg saw in Resort's certificate a great potential that could be developed through effective salesmanship. He had first become intrigued with the "flying houseparty" idea several years ago while a guest on a special flight operated by Scandinavian Airlines System following an IATA Traffic Conferences meeting at Cairo. This flight passed at low altitude over the Pyramids, Alexandria and the scene of Rommel's defeat, stopped over briefly in Rome, and then went on to Paris. It was handled in much the same manner as is employed by Resort today, and Sternberg recalls that it was "just about the most enjoyable flight I ever experienced."

Ably backing up Sternberg is Harold Graham, Jr., who joined Resort in October, 1952, as vice president in charge of the cruise division. Graham had previously served with Pan American World Airways for 14 years, and for two years in the capacity of assistant to the president and general manager of Panair do Brasil. He now holds the post of executive vice president with Resort.

On the operations side, Col. R. W. Knight, formerly with CAA, CAB, American Airlines, and the Air Force (as deputy director of flight safety research), recently was named safety director for Resort with the title of assistant to the president. He functions as Sternberg's "personal representative" on all operations, communications, and maintenance matters.

Editors Win Awards

Two AMERICAN AVIATION editors have been named winners of TWA's 16th annual Aviation Writing and Picture Competition for the technical class. Executive Editor Eric Bramley received an award for the best sales and promotion story, and was named the sweepstakes winner for the category. Anthony Vandyk, international editor, was judged writer of the best operations and development story in the technical and aviation trade publication category.

A Slight Difference of Opinion

ALTHOUGH atomic weapons and jet bombers have been with us for some eight years, the U.S. Army and the U.S. Air Force seem to be far apart in their thinking about these weapons.

Here is the view of General Matthew B. Ridgway, Chief of Staff, U.S. Army, as presented in a speech November 10, 1953: "Because Americans treasure human life so highly, there are some among our people whose anxiety to find some means to reduce the human waste of war leads them into espousal of new and untested devices, machines and weapons in the hope that these can substitute for men.

"No one could be more anxious than I to reduce both the manpower requirements of the Army, and its casualties in combat. At the same time, I have a responsibility to my civilian superiors in the Department of the Army and the Department of Defense, to the President of the United States, and through these officials to the American people.

"That responsibility stems from what I said earlier—that if our nation is forced into war it must win. And I say to you now that notwithstanding new weapons with immensely increased destructive power, notwithstanding the developments in transportation which have brought all points on the earth's surface within a few hours of each other, *the ultimate determinant of military victory still is the trained fighting man with his feet on the ground.*"

What Happened to WW II?

It almost seems that World War II went by unnoticed by General Ridgway.

General Nathan F. Twining, Chief of Staff, U.S. Air Force, in a speech Dec. 3, 1953, indicates that he has advanced somewhat beyond the military thinking of the American Civil War.

He said: "In the past the argument was sometimes heard that air forces in the next great war would, by some miracle, simply "cancel each other out" and leave the issue to be decided by older methods of combat. This argument overlooked the fact that air forces can never blockade each other and can never dig into defensive positions. Consequently, a stalemate without a decision in air warfare is practically impossible.

"It is no more reasonable to imagine that opposing air forces will destroy each other at the same instant than it is to imagine that all the big guns on each side will eliminate each other and leave everything to be settled by rifles.

"In actual fact, air forces have never yet reached a stalemate in war. One side or the other has always achieved air supremacy, and the decision on the surface has always followed the decision in the air.

"Because air forces can be deployed and engaged so much more rapidly than other forces, it is possible that air supremacy may be attained by one side or the other in a very short time.

"Because of the tremendous and growing power of air weapons it appears ever more likely that the ultimate decision will go the same way as the decision in the air."

That seems a more realistic appraisal of the situation than the statement by General Ridgway—"that the ultimate determinant of military victory still is the trained fighting man with his feet on the ground." This outmoded doctrine is based on the theory that the war isn't over until the foot soldier marches into the enemy's capital. But if a hydrogen bomb is dropped on the place there won't be any capital to march into—just ruins.

World War II marked the change from the war of men to the war of machines. Machines by themselves do not fight wars. They are man made and man operated. It still is the man and his will to fight that wins the decision.

However, the art of waging war has been largely taken over by the scientists, the engineers, and the factory workers. They provide the tools of modern war; and it is the nature of those tools that dictates their use in battle.

The most powerful tools today are the atomic and thermonuclear bombs carried by long range jet bombers. We can deliver these bombs to any part of Soviet Russia; the Russians very probably can deliver a like instrument of destruction to any part of the United States. Those are facts that transcend in importance everything else about war that we can think of.

It is entirely within the bounds of possibility that this new and as yet almost untried air weapon may determine the outcome of a global war before more than a small part of two opposing armies have joined action. In a relatively short time—a few weeks, even a few days—one side or the other may have won supremacy in the air.

When that happens, it would be folly for the weakened nation to continue the struggle. For inevitably the stronger nation would grow stronger, while the nation that lost the initial air decision would rapidly grow weaker. It would receive blows from the air that it couldn't ward off, and would grow ever more powerless to return blows of its own.

This was clearly demonstrated in World War II, even with the bombs then available. After the first year of the war in Europe, the German bombers over England were beaten off by British fighters. Thereafter the only bombing done was over Germany; the Germans were solely on the defensive in the air. Their attacks on English cities were restricted to the buzz bombs and the V2 guided missiles.

It was a one-sided air war of which the eventual outcome never was in doubt, at least so far as the airmen were concerned.

Yet that was primarily a land war, with air power emerging as the dominant force only during the closing year of the war. Could air power alone have won the

Only six per cent to air defense

decision? Very probably not. The bombs weren't destructive enough. But that is a condition of the past that no longer prevails. The atomic and hydrogen bombs, the scientists tell us, can wipe out entire cities. Unfortunately we haven't a patent on those weapons. The enemy has them too, and probably in quantity.

Secretary of the Army Robert T. Stevens in a speech December 7, 1953, said: "The Soviet Union has the most powerful mobilized ground forces on earth, great and growing air strength, and an impressive submarine fleet. In view of this potent military threat, I feel we are following the only logical course. We are endeavoring to make ourselves and our allies so strong that the enemy will decide it would be fatal to his own interests to plunge the world into war or to risk the consequences of creeping aggression."

"The uncertain—the perilous—situation in which we find ourselves poses a multitude of thorny problems. It is not easy to strike a proper balance between the utmost in military security—which we cannot afford—and the utmost in economic security—which we cannot risk.

"As a matter of fact, every possible course of action involves a substantial hazard. It is only good sense for us to hold to a middle course which will give us now the utmost in deterrent power consonant with economic stability, and will make it possible for us to fight effectively if war is thrust upon us."

What is the utmost in deterrent power? The utmost would appear to be the power to destroy the Red air force not only in the air but on its bases in Russia and in satellite nations, and also the power to maintain control of the seas against the threat of Russian submarines.

How About Those Battleships?

It doesn't seem that the U.S. Army can make any contribution toward solving these problems. Nor does it seem at all likely that the U.S. Navy needs those four battleships in commission to fight submarines. So, if we have to cut defense spending to balance the budget, why not cut down on those services which do not directly afford us protection against the Soviet's greatest threat to our nation?

At a press conference October 27, 1953, John A. Hannah, Assistant Secretary of Defense (Manpower and Personnel) gave these figures for fiscal '54 year-end strengths of the services: Army, 1,423,000; Navy, 745,000; Marine Corps, 230,000; and Air Force, 960,000.

Navy and Marine Corps combined number 975,000—15,000 more than the Air Force, our first and almost only defense against a Soviet air invasion. The U.S. Army has 463,000 more men than the Air Force. The Army's share in the defense of the nation against air attack is confined to anti-aircraft artillery—not the most effective means of destroying high flying jet bombers.

At the Pentagon they speak of "balanced" forces, but this seems a peculiar sort of manpower balance to arrive at in this jet-atomic-thermonuclear age. Isn't it possible that the balancing would be more realistic if we built up the Air Force, even at the expense of the

other services? If we cannot be strong everywhere, why not be strong in the air, that open road along which enemy bombers may cross our borders?

Only a percentage of the Air Force—not the whole, by any means—is committed to the task of destroying Soviet long range bombers and fighters, at their bases or in the air. The only Air Force commands detailed for this mission are the Strategic Air Command and the Air Defense Command.

The other major commands are engaged in supporting the mission of the Strategic Air Command, the Air Defense Command, and the Tactical Air Command, whose job is to win air supremacy over the battle area.

Supporting commands of the Air Force include Air Research and Development, Air Materiel, Air Proving Ground, Air Training, Air University, Headquarters-USAF, Continental Air Command, and the Overseas Air Commands.

These last are the Alaskan Air Command; Caribbean Air Command; Far East Air Forces, Japan; Northeast Air Command, Newfoundland; U.S. Air Forces in Europe, Wiesbaden, Germany; and the Military Air Transport Service.

The manpower figures for the various Air Force commands are classified, so it is impossible to say how many officers and airmen are serving in the Strategic and Air Defense Commands. But when you consider that the Air Force must divide its manpower among many other commands it would seem that we are depending upon a comparatively small number of men for the defense of our country against air invasion—a couple of hundred thousand officers and airmen in SAC and ADC combined would be a reasonable guess.

According to Mr. Hannah's figures, there were on October 27 3,358,000 people in the services. Now, try to balance that against only 200,000 engaged in air defense and air counter-offensive. Air Defense Command and Strategic Air Command combined have less than six per cent of all the people in our armed forces.

The huge Red Army poses no immediate threat to our country; it could not possibly come here unless our Air Force and our Navy had gone down to defeat. The Russian submarine fleet, while it threatens the possibility of atomic rocket attack against coastal areas, cannot be considered as menacing as the air weapon. The greatest threat to our security—to our survival as a free people—lies in the realm of the air.

A Frenchman once remarked that war was too serious a business to be left to the generals. He implied that only the wisdom of the statesmen could provide sound guidance. Today war seems to have moved into the realm of the scientist, leaving the generals, the admirals and even the statesmen in more or less befuddlement. As a people we must be sadly confused when we devote only six per cent of our manpower in uniform to defense in the air.

Perhaps Secretary of Defense Wilson will take another new look at the situation and see if our forces of land, sea and air are in proper balance. They don't seem to be.

... CY CALDWELL

Short Leases Plague Fixed Base Operators

Complicated charges and short term agreements are common, despite large investments by FBO's.

By Lois C. PHILMUS

WICHITA, KAN.—Fixed-base operators have invested between \$75,000,000 and \$100,000,000 in facilities and equipment on leased space at airports throughout the country, and the group is nearing the \$100,000,000 mark in sales.

These figures were revealed here at the recent National Aviation Trades Association meeting when Glenn J. Degner, NATA's vice president for airports, reported the results of the airport operators lease survey.

The survey dealt strictly with operators using city, county, or publicly-owned airports. The results are based on a 26% return from a mailing of 1600; results were projected for 1200 operations, the total considered to be active.

Although financial figures support the view that the fixed-base industry is solid, the majority of operators report expansion and financing difficulties because "leases are for too short a period and charges, if not too high, are too complicated."

Fifty per cent of the operators relying lease both building and site. Thirty per cent own their buildings on leased land, while 20% have a combination lease under which they lease some buildings and have built some on a

leased site. Thus 50% of the operators have invested capital by constructing facilities.

Despite this record, out of 100 operators, 72 are working on property which is leased for 10 years or under; 24 have 10 to 25 year leases; and only the remaining four out of every 100 have leases for over 25 years.

Degner, in his analysis of these results, states that "it is reasonable to assume that the operator with a substantial investment in fixed assets and equipment has been unable to negotiate a long-term lease. Because of the nature of the business, the only chance an operator has of recapturing a large investment in facilities and obtaining a reasonable return would be through a long-term leasehold or ownership of site by simple fee."

The type of leases vary widely, the survey shows. About 40% have flat rental payments. Some 12% provide for a minimum rental and percentage of gross business. Still another 30% provide for rental and fees on gasoline, number of aircraft owned, or a percentage of business done. Altogether more than 50% of the FBO's hold complicated leases which demand flat rental plus percentage or part of all business done.

It was found that 42% of the op-

erators serve as airport managers, with about three-fifths receiving no compensation. Those receiving compensation find it in the form of credit against rental fees required under the lease. (About 30% of the operators are located on Class 3 airports, with remainder divided equally between smaller and larger fields.)

While 66 2/3% of the airports allow non-aviation activity, one third absolutely prohibit the practice. The same ratio applies to exclusive rights—with the higher percentage favoring competition. Of the replies, 40% have two or more operators at the field.

The average FBO has had 7.7 years experience. Only 5% have been in business for one year and 5% for two.

Commenting on this Degner said: "Either new capital and talent do not regard the outlook in the industry as being promising with respect to the growth of general aviation, or the barriers in the way of investing in the industry are so great that new capital is reluctant to take the risk."

"From the survey," he continued, "it is clear that the difficulty in obtaining security of site is among those barriers. Another is the interference of the Civil Aeronautics Administration."

Diversified service is claimed by 80% of the survey respondents. Twenty-five out of 100 respondents employ between eight and 30 persons; 70% employ one to seven; 5% more than 30.

Despite the growing solvency of the



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FBO industry, one out of every four operators has had difficulties in negotiating or renegotiating present leases. "This fact has added significance," the report observes, "when it is realized that about three-fourths of the operators hold leases running for only ten years and less. In other words, even though the bulk of the operators have been willing to settle for a temporary site, one-fourth of them have still run into snarls getting a location."

CAA's role in the lease problem is revealed by the fact that two out of three airports covered by the survey have received Federal aid. Under sponsor agreements, CAA has authority to supervise the lease-hold which the operator can negotiate.

NATA's airport group has made the following recommendations to be used as a guide for future lease negotiations:

- Minimum of 10 years with option to renew for a minimum of five, but preferably of 10; should be standard where both site and building are leased.

- When purchasing site from airport owner, fee covering franchise or right to operate from airport should be based on volume of aircraft fuel consumed and sold. Suggested rate is two cents per gallon.

- Perpetuity leases should be required when operator leases site but constructs his own facilities. In this

event, it is recommended that rental for the site be based on square- or front-footage basis with consideration given to size and volume of activity of the airport.

- Total annual rental payment should not exceed three per cent of the cost of the buildings erected, with an average of one per cent being considered reasonable.

Minimum Plus Fuel

- Where building and site are leased, a flat minimum should be paid for buildings, plus a fee for franchise based on aircraft fuel sales. Factors to be considered in the computation of the minimum rental should include type and condition of building and amount of maintenance and modification needed. NATA recommends that an independent appraisal of existing buildings should be conducted to establish current value.

Important conclusion drawn from the survey is that "an operator would be unwise not to insist upon the right to dispense aircraft fuel. Although in a number of instances the dispensing of fuel is not particularly lucrative, it is an important lead item to sale of other services, accessories and aircraft." The feeling is also that it is simpler and fairer to compute percentage returns on such sales rather than on gross business, now prevalent.

• • •

Tussle on Over Military Mail Carriage

Two scheduled airlines and a large irregular carrier were battling last week over who should haul overseas military mail for the armed forces.

Seaboard & Western Airlines had offered to carry the mail on the Atlantic route for 25c a ton-mile. TWA and Pan American World Airways, however, said they are already compensated for carrying military mail overseas through subsidy payments, and that no additional pay is necessary from the Defense Department for the continued handling of such mail. Defense had not yet acted on the S&W offer.

Prior to separation of subsidy from service pay on October 1, PAA and TWA carried the mail as a "top-off" load and received no pay because they were on a per-mile mail rate. When they switched to a ton-mile rate on October 1, the Post Office asked the Defense Department to reimburse it for this mail at the 85c ton-mile service rate.

Defense agreed, but added that it would expect the PO to pay for APO-to-APO mail. Such mail is carried by Military Air Transport Service, but revenue from the 6c stamps thereon goes to the PO. Defense said it may also expect to be paid for the military vehicles it lends the PO during the Christmas rush.

Shortly thereafter S&W made its offer.

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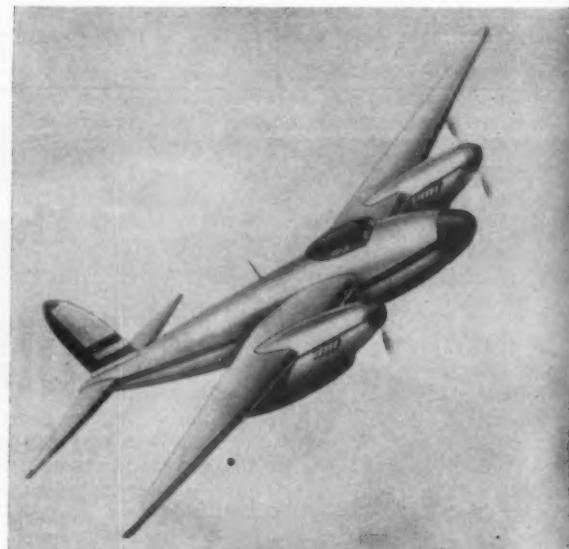
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Converted Mosquito shown above in drawing is being transformed into a high altitude photographic plane by the Flying Tiger Line in its Burbank, Calif., shops. Aviation Export Co. furnished the plane for the experimental venture. Changes in the aircraft will include installation of Packard Merlin 1650-9 engines and pressurization of the cabin to seven pounds. Cruise speed of 40,000 feet is expected to be over 400 mph.



West Coast Talk

By Fred S. Hunter

An open battle appears in the making between arch rivals Los Angeles and San Francisco over trans-Pacific air operations. Currently San Francisco has the upper hand. Foreign carriers like Philippine Air Lines and Japan Air Lines are frozen out of Los Angeles by terms set down by the State Department in the bilateral agreements governing the landing rights of those airlines in the U. S. Los Angeles feels the State Department is being grossly unfair about this. Counter measures have been started. The city of Los Angeles has fired a resolution at the State Department and the CAB to authorize international carriers coming to the west coast to use Los Angeles as a terminal point. The resolution points out that Los Angeles is the bigger market. The Los Angeles Chamber of Commerce has been in contact with the various carriers—and the state's congressional delegation.

Up to now the L. A. drive has been conducted with decorum and restraint. But things might start popping any time. CAB Chairman Oswald Ryan's answer to the Los Angeles airport board's resolution—a typical kiss-off reply—didn't sit well. San Francisco papers say Los Angeles not only is out to get PAL and JAL to move their terminals to southern California, but their Pacific coast headquarters as well. One S. F. paper quotes a spokesman for one of the foreign carriers as saying: "Los Angeles has made us a financial offer too attractive to turn down." Just what financial inducements Los Angeles may be offering remains in doubt. There is no doubt both PAL and JAL would like to serve Los Angeles, but whether they would want to give up San Francisco to do so is something else again. Anything can happen when Los Angeles and San Francisco go on the prowl for competitive business. A fine political Donnybrook could easily ensue.

One of the more important reasons why the squabble over rates and charges at the San Francisco International Airport remains unsettled and has resulted in the TWA, United Air Lines, and Western Air Lines lawsuits is the take-off charge for non-revenue flights. Most airports do not assess landing fees against training and other non-revenue flights. Only concession San Francisco makes is a 10% discount. Under San Francisco's tonnage formula, the bigger the airplane the higher the take-off fee. It's 15¢ per pound for planes grossing between 10,000 and 49,999 pounds; 15½¢ for planes between 50,000 and 99,999 pounds; 16¢ for planes between 100,000 and 150,000 pounds. This puts the Boeing 377 high on the scale at \$22.80 for a revenue flight. The 10% discount makes a crew training flight come to \$20.52. This can get expensive at a point where crews are based. A DC-3 comes out at about \$3.75 for a revenue take-off; a Convair at \$7.50; a DC-4 at around \$11; a DC-6B at \$16. It is San Francisco's contention the heavier planes should foot more of the bill because they are harder on runways.

The X-3, the Douglas research job with the wicked-looking snoot, which finally got its picture in the papers recently, apparently has turned out to be an aerodynamic gem. Reports from Muroc indicate NACA is getting more valid supersonic data out of it than any other plane it has had in flight test at the desert base.

WEST COAST MISCELLANY—Joe Glass is the latest pilot on American Airlines' western division to reach the 25-year service mark. The others are: H. B. Russell, J. G. Ingram, W. J. Hunter and R. J. Rentz. . . . Hugh A. Cover, who owns Arrowhead Aviation, Inc., which operates the Southern California division of BACA Airlines, is the son of the late Carl Cover, onetime executive vice president of Douglas. . . . For the first time the Pacific-Alaska division of Pan American voted its maximum suggestion award, \$500, to a girl. She's Bergit Birkland of scheduling. She suggested each captain departing San Francisco be furnished a card giving status of the landing and take-off requirements of himself and the first officer so he can see that each crew member remains qualified on the trip, thus avoiding the necessity of taking a training flight to meet CAA requirements. . . . Good reports keep coming in from passengers on American Airlines' DC-7 trips. They like both the airplane and the service.

DECEMBER 21, 1953



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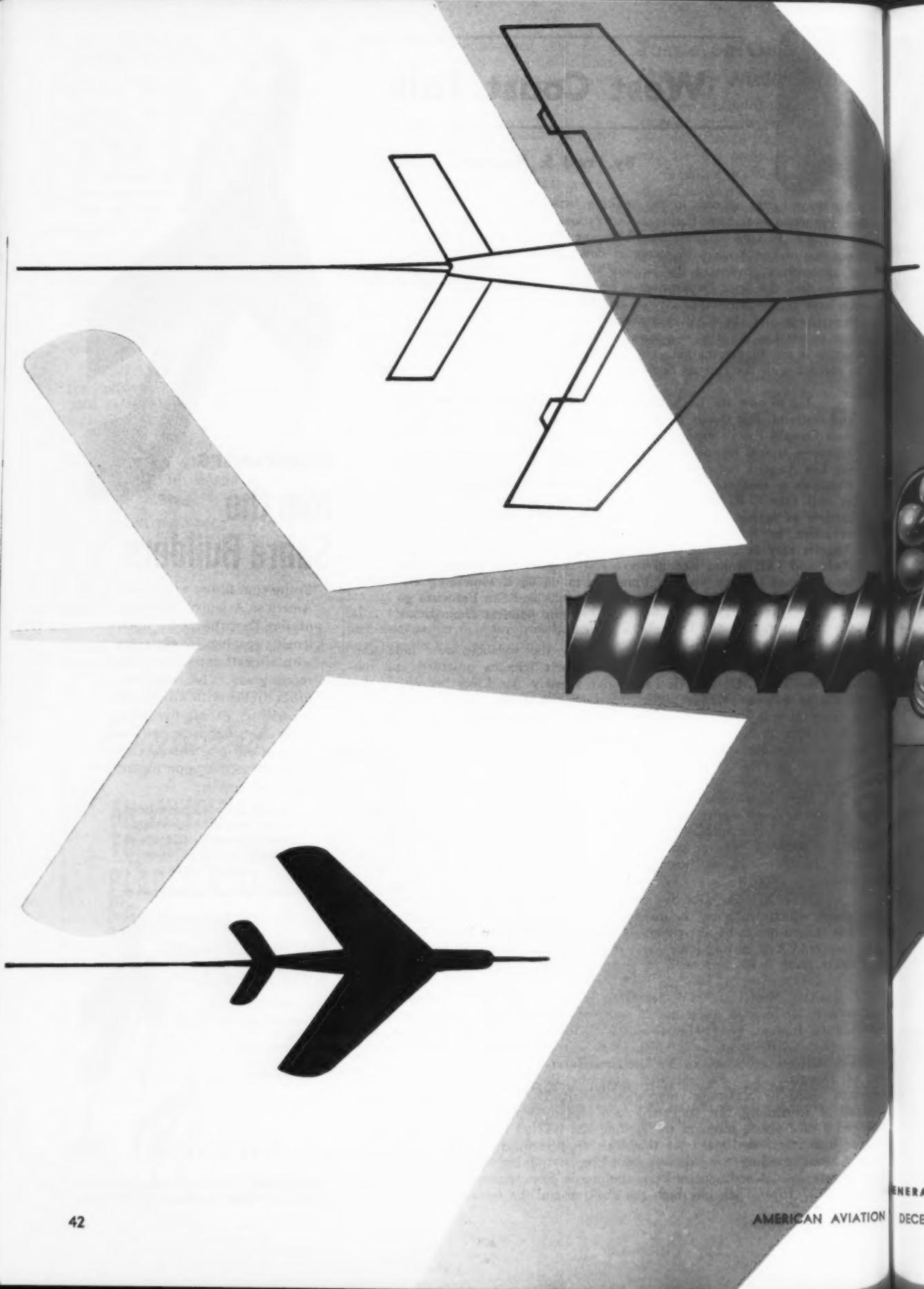
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DECEMBER 21, 1953

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Extra Section

By William V. Henzey



CHAMBERS of Commerce of Florida and California are probably re-shaping advertising campaigns as a result of the record-breaking National Airline DC-7 delivery flight last month which closed the time gap between the same resorts to 5 hours, 50 minutes, 12 seconds. But more significant was the reaction of National, which will fly the DC-7's on 3½ hour nonstops between New York and Miami, or of the celebrities of screen and sport aboard the delivery flight, or even of this writer as the only member of the press aboard.

First impression gained was that such a speed record was no accident. National's president G. T. Baker, chief pilot Dave Gannon, and pilot "Skeeter" Royal were on hand constantly at the Douglas Aircraft plant in Santa Monica, Calif., for over a week before the flight, usually starting at 6 a.m. For two hours on the morning of the flight, Gannon, Royal, and Douglas test pilot Bob Rush ran the four big Turbo-Compound engines, timing readiness with the arrival of screen personalities Joan Evans, Barbara Darrow, Madelyn Wells, and Janet Hausbrouck, and world tennis star Jack Kramer.

Hardly had the television cameras stopped grinding and Douglas photographer Stan Raymond taken his last shot when the new giant ship took off in a climb this writer will long remember—straight out and up. We passed Phoenix in one hour and settled at 25,000 feet for the remainder of the flight. With an official average speed of 407 miles per hour and a peak speed at one point of 485 mph, we erased a record of 6 hours, 38 minutes set in 1947 by an Eastern Air Lines Constellation. Tailwinds were described as "below average" for this time of year.

There was a certain inspiration in seeing a modern-day flight in a piston-engine commercial plane thrilling such aviation veterans as Baker, the three pilots, Bob Johnson and Ken Boedecker of Curtiss-Wright, John Day of Grant Advertising, R. L. Sawyer, NAL operations engineer, and businessmen Norvin Harris and L. E. Bower. As for glamour, the four movie actresses and five National stewardesses supplied it abundantly. Misses Rosella Martinez, Bonnie Keith, Joan Carl, Jean Britt, and Pat Sanford were described by NAL public relations counsel Milt Dean Hill as "typical" of what must be the most beautiful collection of stewardesses in the business.

Gannon, Royal, and Rush described the DC-7 as a "pilot's dream, maneuverable with two fingers." To Milt Hill and Bill Ehart, NAL's public relations director, the flight was "one big enjoyable headache crowned with success." To this writer, the DC-7 trip was a wonderful experience topped off with a ride around Miami in National's new S-55 helicopter. They make a terrific combination.

NATIONAL PRESIDENT G. T. Baker in cockpit of DC-7 with Chief Pilot Dave Gannon.



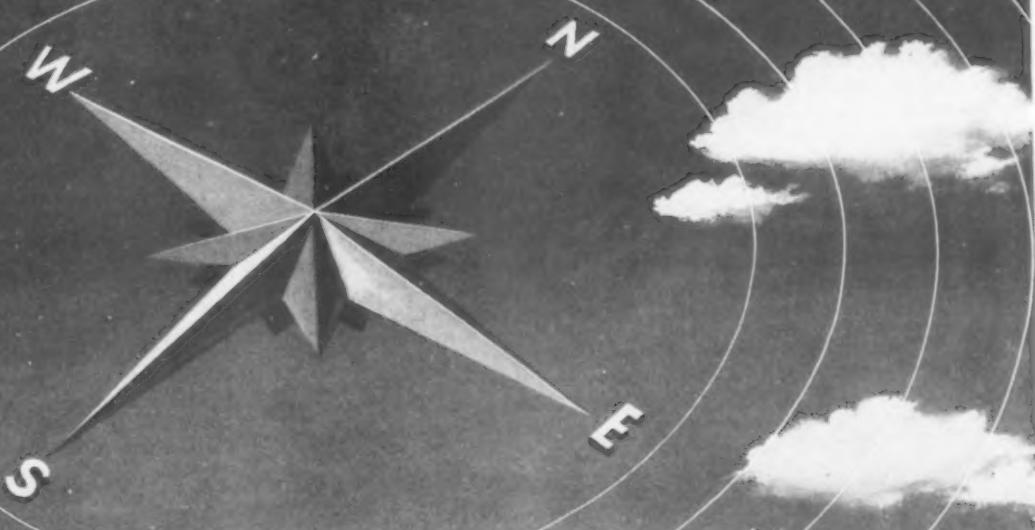
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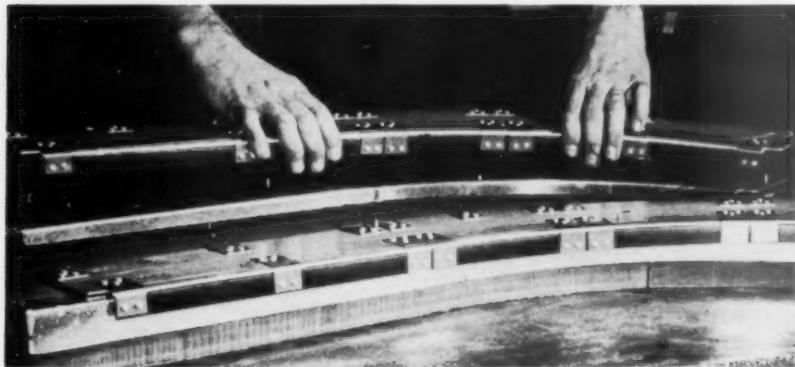


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dependable airborne electronic
equipment since 1928*

Aircraft Radio Corp.
Boonton, New Jersey



Maintenance Bulletin Board



Overpressing Replaces Hand Forming

Overpressing—a new fabrication operation that displaces the hand forming of pressed aircraft parts after hydroforming—is paying big dividends at Temco Aircraft Corp. of Dallas, Texas. By the use of a new overpress cover plate designed by Temco's W. T. Phillips, savings of over \$5000 annually are being realized.

The system suggested by Phillips uses an inexpensive cover plate which is essentially a flat piece of .125 aluminum shaped to conform to the die top. Two steel flanges are attached to the top plate by metal strips riveted to both

the plate and the flanges.

These flanges serve as a forming die on the outside of the part and eliminate buckling or wrinkling and the imperfect side joggles usually found on a part after its first hydropress operation.

In effect, the procedure at Temco substitutes a second trip through the hydropress with the cover plate installed for the past handforming with mallets to remove these imperfections.

Temco reports it has built units for 175 dies at a cost of only \$400. It is now in use for forming up to .040 aluminum.

• • •



NEW AND OLD Sperry Zero Reader installations as used by PAA.

Zero Reader Weight Cut by Pan Am

A modified version of the Sperry Zero Reader, devised by Pan American World Airways Pacific-Alaska division for installation in Boeing 377 airplanes, reduces the weight of the system by some 16 pounds and requires less than one-half of the original installation space.

The military version of the Sperry instrument navigation system weighed 22 pounds. When PAA decided to equip the Stratocruisers operating in the

Pacific its operations engineers discovered that by making use of instrumentation already installed in these airplanes this weight could be reduced to eight pounds.

In this rework PAA removed the altitude control, vertical gyro and gyro fast erector. The computer was also modified by removing the go-around relay and a-c blower and incorporating the unit in a smaller case.

• • •

Report Analyzes Comet Delay Times

A cross section of an airline's time schedule operation with a jet transport is revealed in a British Overseas Airways Corp. service analysis during a recent four-week period. Between August 16 and September 12, 1958, BOAC operated 1254 schedule hours with the Comet I and experienced a total of 160 hours delay for all causes, almost 13% of scheduled elapsed time.

The subsequent flights of delayed aircraft recovered approximately 20 hours of this total, bringing the net delay time down to 120 hours or 11.2% of the scheduled elapsed time.

The breakdown of delay hours by various causes shows:

Cause	Hours	% of Total
Mechanical	20.39	1.6
Weather	92.42	7.5
Operational	9.15	0.7
Traffic	11.33	0.9
Late connections	26.00	2.1
Total	160.09	12.8

Aside from the small percentage of delay hours charged to mechanical causes in the jet operation, which compares with percentages in the order of 40% experienced by the operation of present U.S. airline transports, a further BOAC breakdown of these mechanical causes reveals quite a departure from the usually high percentage of delay time charged to reciprocating engines in airline operation.

For the 1254 hours of operation, mechanical delays were caused by:

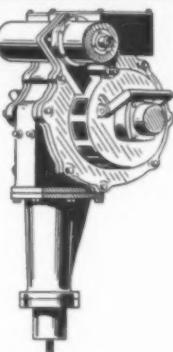
Cause	Hours	% of Total
Power plants	1.28	0.1
Electrical	2.42	0.2
Hydraulics	5.54	0.5
Landing gear	3.41	0.3
Radio	1.50	0.1
Instrumentation	3.16	0.3
Miscellaneous	1.48	0.1

Sun Visor Picked

United Air Lines and American Airlines have standardized on the Hardman Mono-rail cockpit sun visor (AMERICAN AVIATION, June 8) for fleet installation in all types of aircraft. The unit is fabricated from non-magnetic materials and is produced by the Hardman Tool and Engineering Co., 1845 So. Burndy Drive, Los Angeles 25, Calif.

skyhook

...for a BIG LIFT



CARGO HANDLING • TOWING • ENGINE CHANGING
RAMP OPERATING • RESCUE WORK • OTHER USES

an airborne
hoist by



■ Easy does it with a hoist by BREEZE. Here's 10,000 pounds being lifted by a 150-pound airborne winch.

It's one of a new line of cargo-handling devices designed to meet specific needs in aircraft operations, where custom-built features are required.

All of them embody extreme compactness and light weight in relation to high rated load. They are precision geared and braked for control refinements, with overload and safety features. They save time, labor and space.

Consult BREEZE engineers for the newest in electrical, mechanical or hydraulic hoists to meet your individual conditions.



Radio Ignition Shielding



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HIGHLIGHTS IN **Jet Engineering**

**Easier maintenance...
Faster engine changes...
key to increased
operational availability**

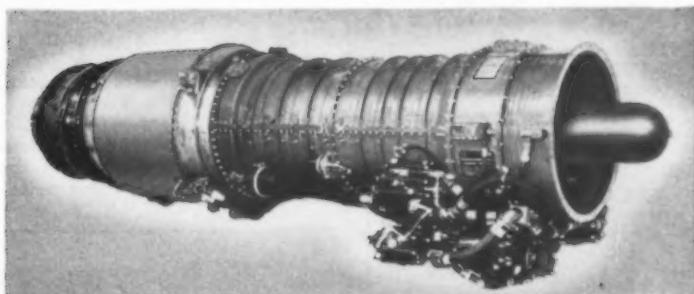


Once performance and power have been built into military aircraft, engines must make it constantly available to maintain maximum striking power at all times. This factor—availability—is built into every Westinghouse turbojet. From its first American designed axial-flow jet engine, Westinghouse has improved performance, improved materials and structure by testing new designs . . . increasing durability and simplifying all parts, assemblies and components. This has lengthened time allowed between overhauls, streamlined routine maintenance, speeded field service . . . and has made it possible for Navy airplane mechanics to change a complete J34 engine and have aircraft returned to operational status in less than an hour!

The McDonnell F2H-2 "Banshee" has shown how these advantages have paid off in U. S. Navy fleet operation. Its Westinghouse J34 service record, during combat and maneuvers, contributed to the establishment of aircraft availability levels over 80%. Likewise, U. S. Navy records for jet-powered aircraft were made in terms of sorties and hours flown without engine failure.

The more powerful Westinghouse turbojet engines now being qualified and readied for production will offer these same advantages—providing better, more advanced and reliable driving power for both military and commercial air leadership. Westinghouse Electric Corporation, Aviation Gas Turbine Division, Lester Branch P. O., Philadelphia 13, Pennsylvania.

J-54027



Twin Westinghouse J34 turbojet engines power the U. S. Navy F2H-2 "Banshee", helping to give it the high performance that has made it outstanding in Korean combat operations.

YOU CAN BE **SURE**...IF IT'S
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Official U. S. Navy Photograph



25%

**increased
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**TECO
28 place
DC-3 and
C-47
seat
kits!**



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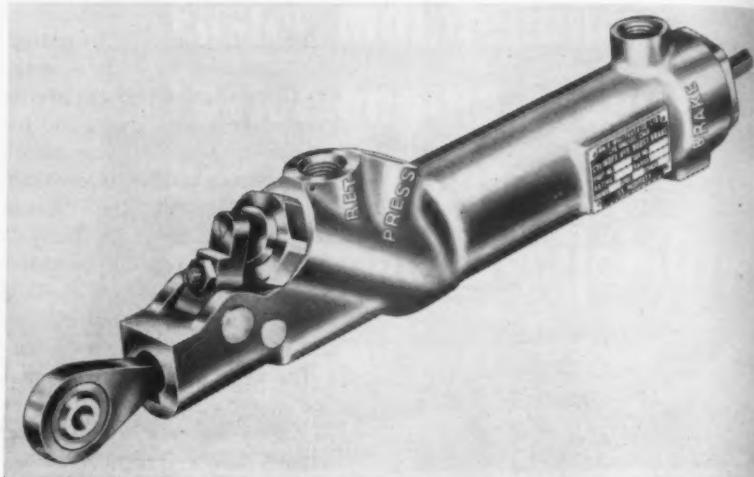
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REPRESENTED IN CANADA BY:
Railway & Power Engineering Corporation Limited
3748 St. James Street • Montreal 39, P.Q.

New Products



New Master Brake Cylinder Developed

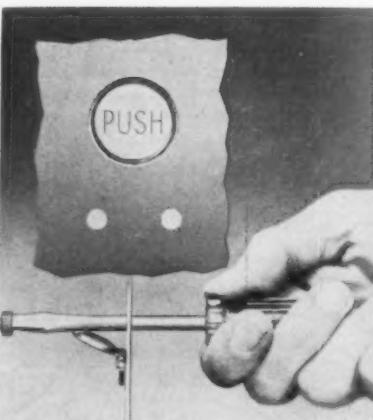
A new power boost master brake cylinder which combines the functions of a power brake valve and master brake cylinder into a single unit weighing less than two pounds has been developed by the Wm. R. Whittaker Co. Ltd.

Its design is intended to provide greater braking efficiency in jet fighters and light bombers without the penalty of excessive weight. The model shown above can be modified to meet all requirements and accommodate any desired volume.

Aside from its weight and size advantages, the new Whittaker brake com-

ponent features minimum hysteresis, absence of chatter, instantaneous response and simplicity of operation. In event of complete loss of aircraft hydraulic system pressure, the pilot's normal reaction is to increase brake pressure. With the new power boost master brake cylinder in the system, this movement will produce enough braking pressure to stop the airplane.

Address: Wm. R. Whittaker Co., Ltd., Dept. AAP, 915 No. Citrus Ave., Los Angeles 38, Calif.



Access Door. A "captive" aircraft access door of the spring-hinged type that cannot separate from the surrounding panel once it is installed has been announced by the Camloc Fastener Corp.

Designed for flush surface installations, the new Camloc door is suggested

for areas requiring frequent adjustments during service, calling for screwdrivers or similar tools.

The door opens simply by pushing against it with the tool, and closes automatically when the tool is removed. Of stainless steel construction, the access unit is being produced in a standard $\frac{3}{4}$ " dia size, with other sizes producible if required.

Address: Camloc Fastener Corp., Dept. AAP, Spring Valley Road, Paramus, N. J.

Remote Control. For unattended communications stations, a new remote control system which is designed specially for airways radio communications control is being marketed by Schuttig and Co., Inc.

The device features complete elimination of the use of d-c current, permitting its use over any ordinary speech telephone line or radio link regardless of the number of repeaters used.

The new unit provides for operating six separate circuits with a single operator



REMOTE CONTROL SYSTEM

control unit. Only a single telephone line is required to turn a transmitter on and off, select a desired operating frequency, carry the outgoing voice signal to the transmitter, and return the receiver signal to the control center.

Address: Schutte and Co., Inc., Dept. AAP, Ninth & Kearny Sts., N. E., Washington, D. C.



Regulator. A new diaphragm type air-oil pressure regulator which weighs less than one pound has been developed by United Aircraft Products, Inc. and is being used for pressurizing the hydraulic reservoir tank in the Republic F-84F and RF-84 aircraft.

It maintains a minimum regulated pressure in the hydraulic supply tank during fluid level change and also protects against excessive pressures caused by the pumping of fluid into the tank faster than it can be used.

The regulator also features a vacuum venting valve which compensates for changes in atmospheric pressure and prevents a vacuum condition in the tank. A check valve protects against the bleed-back of air or hydraulic fluid into the upstream lines during engine shut-down or pump failure.

The new UAP valve is designated the model U-513150-2 and is rated for operating temperatures from -62° F. to +250° F. and a flow of 1 1/2 gpm hydraulic oil at 24 psi.

Address: United Aircraft Products, Inc., Dept. AAP, Box 1035, Dayton 1, Ohio.



Model PERFORMANCE!

You can relax now — Santa Claus will NOT get lost hunting your chimney Christmas Eve. On instruments like these, he could salvo his baggage down a piece of macaroni!

For this reassurance, we can thank Dallas Secretary Alice Gunn who solved the problem of what to give a guy who's got everything, by giving him a custom-designed Southwest Airmotive instrument panel, its components scientifically calibrated, balanced, and tested on the latest Eclipse-Pioneer-approved equipment.

If Santa is the curious type and wants a peek at the backside, he'll find the panel plumbed and wired for quick, easy removal.

If, on the other hand, he wants to swap the panel for Alice Gunn, we can only tell him she's 21, blonde, blue-eyed, 118 pounds, and 5' 6". From there, he's on his own!



WORLD'S PREMIER AIRPLANE FABRIC

lighter — stronger — smoother

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Leading Manufacturers of
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User Charge Plan Hit by ATA, NASAO

The government's proposed airway user charge program has been declared unacceptable in its present form by two industry associations, the Air Transport Association and the National Association of State Aviation Officials.

ATA's user charge committee, under the chairmanship of Milton W. Arnold, has notified CAA Administrator Fred Lee that it would oppose any such charges above the present 2¢ gas tax unless all forms of transportation were subject to a general user charge plan, the military bore its share of the burden, and 30% of the annual airways cost were allocated to military standby value before any costs were allocated on basis of use.

In addition, ATA feels "The use of 'value of the service' in the allocation of costs is an incorrect application of a pricing principle. The use of this principle to fix costs results in shifting to the scheduled airlines costs which are the responsibility of the military and other civil groups."

NASAO reiterated that user charges should be placed on all other forms of transportation receiving Federal assistance.



Airline Commentary

By Eric Bramley

HEARD during a recent visit to a west coast aircraft plant: "The transport plane has yet to be built with sufficient payload to lift the blueprints that went into its design."

American Airlines has a new problem in connection with its nonstop transcontinental DC-7 service. The Wright Turbo-Compound engines, with their short exhausts, throw out quite a flame during climb, descent, and when the props are reversed on landing. Anticipating that inexperienced riders are going to be apprehensive during night flights, AA has instructed its stewardesses to make certain that passengers are informed, via public address announcement, that this is normal operation.

Regarding the DC-7, let's scotch some rumors. We were aboard the AA east-west press inaugural which, instead of flying New York-Los Angeles nonstop as scheduled, landed at Denver en route. When we returned east, we heard rumors that the plane had landed because it was "running out of gas," because the pressurization system "blew up," etc. The facts are: in the nosewheel well is located a small cap which is removed during ground tests of the pressurization system. The cap was lost in flight. If we recall correctly, cabin pressure at 20,000 feet was about 12,000, so Capt. Walt Braznell descended to 12,000 feet. Later he tried 18,000, but the pressure still wouldn't hold, so he wisely landed at Denver, with his passengers' comfort in mind. With clear Los Angeles weather, he had sufficient gas to make it nonstop, but it would have been an uncomfortable ride. His decision, which he explained in detail over the PA system, met with 100% approval of the writers aboard.

Allegheny Airlines, in a commendable attempt to reduce passenger inconvenience to a minimum this winter, has started a new "passenger advisory service." Two hours prior to a plane's departure from originating terminal, each station receives an "operating forecast" advising of any known variation from schedule. When a variation is indicated, Allegheny is trying its best to contact passengers and advise them before they leave their offices, homes, or hotels for the airport. Persons meeting flights will also be able to obtain such information. Once passengers learn they can depend on what the airline says, the system should result in satisfied customers.

An old practice in the airline business has been to put together names of passengers or crew members to form unusual combinations—Black and White, Day and Knight, etc. Most of them follow this pattern, but we think Tom Bell, TWA's Washington public relations man, has come up with some unusual ones from the company's crew list. Examples: Thrush-Sparrow, Simmons-Bedding, Downing-Street, Foster-Parent, Olson-Johnson, Martin-Lewis, St. Charles-St. Peter, Hill-Dale. "I note also a Gibson and a Staggers!" Tom says.

ODDS AND ENDS: Capital Airlines in November passed (for the first time in history) the \$1 million mark in charter revenue for the year, considerably ahead of other carriers. . . . United Air Lines' 1954 advertising plans include a switch from the current "educational" picture-caption series appearing in general magazines. New ads will revert to art, with one illustration dominating the page. . . . In a campaign to increase air mail use, Continental Air Lines' employees are wearing plastic emblem buttons with the words "Use Air Mail" in red on a white background. With approval of local postmasters, postal clerks and carriers are also wearing the buttons. . . . If you can get a copy, we recommend you read "A Tale of Tourists," the poem written at the IATA traffic conference meeting in Honolulu, describing negotiations over differences in tourist and first-class services. One of the best IATA documents we've seen yet. . . .

**HOME OF THE FAMOUS
Hawaiian Room**
THE PERENNIALLY POPULAR
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MANUFACTURING

A. M. Wilson, vice president in charge of the aeronautical division of Minneapolis-Honeywell, has been elected to the company's board of directors. **Harold W. Sweatt**, has been named the board's chairman, succeeding **Mark C. Honeywell**, who is retiring; **Paul B. Wishart**, vice president and general manager, succeeds Sweatt as president.

Matthew J. Betley has been appointed vice president and general manager of Aeroquip Corp. Prior to this promotion, Bentley was the firm's vice president of manufacturing.

Arthur W. Cruse has joined Lear, Inc. as division general manager of the recently formed Lear Aircraft Service Division. Prior to joining Lear, Cruse was vice president and general manager of L.B.S. Aircraft Corp.

Clyde Parton is the new director of engineering for the Aeronautical Division of Minneapolis-Honeywell Regulator Co., replacing **Frank R. Cook**, who now heads the division's research and planning organization.

Charles C. Busenkell, former assistant chief engineer at the Bendix-Pacific Development Laboratories, has been appointed executive engineer in charge of west coast operations of Continental Aviation and Engineering Corp.

Walter B. Powell, formerly vice president of sales for the McCauley Industrial Corp., has been named manager of Aircraft Products Sales at Air Associates' Midwest Aviation Supplies Division, Chicago.

Donald B. Morse has been appointed sales manager of the Scintilla Division of Bendix Aviation Corp. Morse's previous post, manager of sales in the Western States, has been taken over by Gerald Terpenning.

H. E. Weihmiller has been appointed design engineer for Republic Aviation Corp. Weihmiller, a vice president of Consolidated Aircraft Corp. from 1937 to 1942, was most recently director of the Aircraft Consulting Service, Washington, D. C.

AIRLINES

John M. Hawkins has been elected a vice president and **Bert M. Harsh** a director of Hawthorne Flying Service. Hawkins is manager of Hawthorne's base in Charleston, S. C., and Harsh is assistant manager of Hawthorne's School of Aeronautics at Moultrie, Ga.

Delton Goerke, formerly with the Federal Bureau of Investigation, has been named to succeed **L. J. Peatman** as special investigator for United Air Lines at San Francisco.

Larry Olenick has been appointed head of National Airlines' newly created New York office of public relations and news bureau.

Hamlin B. Johnson is the new president of the Aircoach Transport Association. Johnson, who had served as the association's executive director, will continue his headquarters in Washington, D. C.



John A. Collings, executive vice president of Trans World Airlines, receives his 25-year pin from airlines' president, Ralph S. Damon.



The following employees recently completed 20 years or more of service in the aviation industry:

- **James Murray**, Boeing Airplane Co. Vice president, Washington, D. C. 25 years.

- **Richard Gelzenlichter**, Boeing Airplane Co. Assistant director of contract administration, Seattle. 25 years.

- **Winfred Sabin**, Boeing Airplane Co. Tooling inspector, Seattle. 25 years.

- **Paul Davis**, Boeing Airplane Co. Experimental division superintendent, Seattle. 25 years.

- **Joseph Paden**, Boeing Airplane Co. Inspection supervisor, Seattle. 20 years.

- **Basil Rowe**, Pan American World Airways. Captain, Miami. 25 years.

- **Clarence A. Reppert**, North American Aviation, Inc. Checking group leader, Los Angeles. 25 years.

- **Murl V. Rodman**, Trans World Airlines. Line maintenance assistant foreman, Los Angeles. 25 years.

- **Melvin O. Bowen**, Trans World Airlines. Dispatcher, Los Angeles. 25 years.

- **J. V. Herwig**, American Airlines. Foreman, Stores, Tulsa. 25 years.

- **Mary P. Harrity**, American Airlines. Secretary, office of the Treasurer, New York. 25 years.

- **M. D. Ator**, American Airlines. Captain, Tulsa, 25 years.

- **Edward G. Giddeon**, Trans World Airlines. Sheet metal foreman, Kansas City. 25 years.

- **Kurt Klein**, Consolidated Vultee Aircraft Corp. Foreman, San Diego, 25 years.

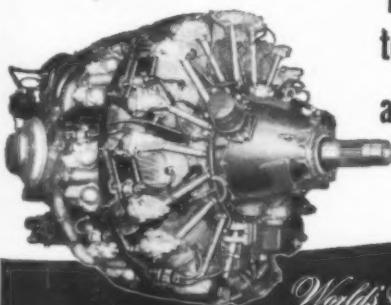
22 LEADING WORLD AIRLINES HAVE SELECTED TURBO COMPOUNDS



has selected

TURBO COMPOUNDS

to offer greater speed and comfort through 16 states
and 7 countries with **DOUGLAS DC-7's**



CURTISS-WRIGHT

World's Finest Aircraft Engines CORPORATION • WOOD-RIDGE, N. J.

CAB Revokes Air America Registration

CAB has revoked the letter of registration of Air America, Inc., Burbank-based non-scheduled airline, for "knowing and willful" violations of the Act and regulations which a three-man CAB majority termed "contumacious defiance."

Revocation is effective at 12:01 a.m., January 9, 1954. Air America is charged with conducting excessive operations in the New York-Chicago-Los Angeles market and with ticketing violations. The majority, Chairman Ryan, Vice Chairman Denny, and Member Gurney, said the violations "have been of a flagrant character and indicate a studied indifference to the economic regulations."

Members Josh Lee and Joseph R.

Adams dissented. Lee said that revocation should not be invoked until the Large Irregular Carrier Investigation, now in progress in Los Angeles, is completed. Adams said the sanction is "too severe" and is hard to reconcile with other enforcement actions against non-scheduled lines wherein the Board merely issued "cease and desist" orders but did not terminate their licenses.

The majority said revocation is "the only effective remedy available to us. Moreover, our failure to revoke respondent's letter . . . under the circumstances involved here would serve only to encourage other irregular carriers to engage in similar violations, secure in the knowledge that their authority to operate would not be jeopardized."

Free Pan Am Ferry Trips Held Legal

CAB has upheld arguments of Pan American World Airways that transportation of invited guests free of charge on New York-Miami ferry flights is not a violation of the Act. Except, the Board added, where such guests continue on beyond Miami as commercial fare-paying passengers of PAA, in which case the line is ordered to cease and desist from such practices.

Pan Am serves New York on Atlantic routes and Miami on South American routes but has no authority to operate between the points on a common-carrier basis. CAB's enforcement office contended that Pan Am violated the Act by granting free passage on ferry flights operated to and from Miami for maintenance purposes.

The Board, although expressing

"deep concern over a practice that results in free carriage of selected members of the public on an extensive sale . . . over routes of other certificated carriers," found that Pan Am had committed no violation.

"Upon consideration of all the facts," the agency said, "it is our opinion that . . . we would not be warranted in finding that the services in question constitute common carriage and, hence amount to air transportation."

Also, the agency found there has been no violation of the discrimination provisions of the Act as a result of PAA's carrying individual invited guests free while, on the other, charging for certain charter flights over the same route.

CAB MISCELLANY

Ozark Air Lines asked CAB for a Chicago-Detroit route extension via intermediates now served by American Airlines. Ozark asked suspension of AA at the intermediates. North Central and Lake Central have asked similar authority.

Atlas Corporation, named in an enforcement complaint with Northeast, Convair, and Airfleets, Inc., denies that transactions involving sale of NEA Con-

vair aircraft were in violation of Act or any CAB order.

National Airlines has been granted special tariff permission to effect a two-level fare tariff similar to that adopted recently by Eastern.

Trans-Pacific Airlines applied for renewal of its Hawaiian certificate, which otherwise expires in June, 1954.

CAB News

AS OF NOW . . .

Hearings originally scheduled for December in the **Denver Service Case**, one of three major route cases now under way, have been postponed now until April 5.

The Los Angeles session of hearings in the **Large Irregular Air Carrier Investigation**, under way since August 3 and recessed on December 11, will resume in L.A. in mid-January. They will consume at least three more months in that city and then, after a short interval, will move on to Seattle.

There is still no word from the White House on CAB's decision favoring an Eastern-Colonial merger in the **Colonial Merger Proceeding**. Decision was forwarded by the Board on September 14. But there has been activity with both the Justice Department and Securities & Exchange Commission interested in the case.

The **North American Airlines Enforcement Case**, stalled for a summer-long court fight, is still comparatively inactive. A stipulation forwarded by CAB's Office of Compliance for agreement by North American has been pending for six weeks. When finally agreed to, it will become part of the public record, a system being used instead of formal public hearings.

RECENT CAB DECISIONS

• **Continental Air Lines** and Riddle Airlines granted special exemptions for extra services transporting military personnel over the holidays.

• **Mackey Airlines** turned down on bid for exemption to serve Tampa and St. Petersburg as co-terminals on certificated route between West Palm Beach/Palm Beach, Fort Lauderdale, and Nassau.

• **Prohibition against air taxi operator using business names with the words "airlines," "airways," etc., eliminated as unnecessary.**

• **Pioneer Airlines** authorized to suspend service at Tucumcari, N. M., because of low loads.

CAB CALENDAR

Jan. 5—Hearing in United Air Lines Mail Rate Case (Hawaiian operations). Washington, D. C. Docket 2913.

Jan. 5—Hearing in Reopened Latin American Air Freight Case. Washington, D. C. Docket 2888.

Jan. 6—Hearing in Northeast Airlines Provincetown Service Case. Washington, D. C. Docket 6204.

Jan. 6—Hearing in Charleston-Columbus Service Case. Tentative. Place to be announced. Docket 6348.

Jan. 18—Hearing in Lake Central Airlines Acquisition Investigation. Washington, D. C. Docket 5770 et al. Postponed from Nov. 30.

Jan. 25—Hearing in Domestic Freight Forwarder Investigation. Washington, D. C. Docket 5947 et al.

Feb. 1—Hearing in Southern Atlantic Renewal Case (Pan American World Airways). Washington, D. C. Docket 5818. Postponed from Jan. 5.

Apr. 7—Hearing in Denver Service Case (TWA et al.). Washington, D. C. Docket 1841 et al. Postponed from Dec. 7.

INTERNATIONAL AVIATION

Edited by Anthony Vandyk



INTERCOM

One of the least publicized parts of the current British jet transport development scene is the effort which is being directed toward solving deceleration problems. The difficulties involved in landing jets on ice-covered runways have long worried BOAC. The Comet, in its present form, has to be brought to rest wholly by its brakes. This requires good tire adhesion, which may be lacking at such places as Gander where the concrete runways are often glazed with sheet ice in the winter months. To assure deceleration under these conditions the British have studied a variety of methods ranging from the fairly orthodox, such as ultra-large drag flaps (difficulty here is to obtain sufficient resistance purely aerodynamically), to the almost fantastic. In the latter category may be placed a proposal to send flame-thrower equipped trucks along the runway to melt the ice just prior to the aircraft landing.

The answer for the future, British experts believe, is undoubtedly in reverse thrust, but just when an adequate system will be available is anyone's guess. The SNECMA "cascades," with permanent 10% thrust loss, are unacceptable. Rolls-Royce is believed to have worked out a new method, but no details have been released. Any reverse thrust device is likely to weigh as much as brake discs and must be applied to all four engines to avoid danger of asymmetric thrust in the event of engine failure.

Other deceleration devices under study in Britain include brake pressure pads applied directly to the runway surface; nylon rope arrester gear, which might prove practicable but would call for special one-user equipment at airports; and tail chutes, the disadvantages of which include uncontrolled yaw in a crosswind, encumbrance of runways, and unfavorable time factor for rapid turnarounds.



PRODUCTION LIGHT BOMBER, the Ilyushin Il-28-2.

Russian Light Bomber, Delta Fighter

News of Russia's production light bomber and of a new Soviet delta fighter has come from AMERICAN AVIATION's intelligence sources. The Ilyushin Il-28-2 (illustrated above), swept-wing (40°) version of the Il-28, is now in operational service with the Red Air Force—about 200 were delivered up to last September. It is, however, an interim aircraft due to be replaced by the much larger EF-150.

Reason for the Il-28-2's inadequacy is its relatively poor performance despite its powerful Lulkov axial jets: cruising speed, 530 mph; top speed, 620 mph; ceiling, 41,000 feet; operating radius, 500 miles or 600 miles with auxiliary

tanks. Armament comprises four fixed 23-mm cannon in the nose and two in the rear.

The Cherenovsky BITsh-22 delta-wing all-weather fighter (illustrated below) made its first flight this summer. Powered by a VK-2 centrifugal-flow jet, the aircraft's performance is not outstanding: top speed, 635 mph; cruising speed, 530 mph, landing speed, 125 mph; and ceiling, 46,000 feet.

Its radar has a range of 5000 feet. Armament comprises six 23-mm cannon. The BITsh-22 has a span of 46 feet 2" and a length of 40 feet. Wing area is about 480 square feet. • • •



ALL-WEATHER FIGHTER, the Cherenovsky BITsh-22 delta.

INTERNATIONAL AVIATION

MILITARY

GERMANY: Equipment to be used by the revived German Air Force will probably include the following types, it is reliably reported. Trainers: Fokker S.12 and North American T-6. Fighters: Hawker Hunter and North American F-86. Helicopters: Sikorsky S-55 and Piasecki HUP-2.

INDIA: Indian Air Force is purchasing 28 Fairchild C-119 Packets. A batch of the 71 Dassault Ouragan fighters for the IAF has been ferried to Bombay on the French carrier Dixmude. India is paying France \$137,130 each for the planes.

FRANCE: When the French Air Force gets its Fouga 170R Magister light jet trainers the current pilot training program will be reduced by 45 hours' flying time. Under the new schedule there will be 15 hours of primary training, 35 hours on piston-engine two-place aircraft, 140 hours on the 170R, and 10 hours on the Lockheed T-33.

SWEDEN: The Swedish Air Force is considering placing an order with de Havilland-Canada for 40 to 45 Otter single-engine light transports. Sweden's present military transports are mainly Junkers 86K's and Douglas DC-3's.

CANADA: A \$10 million order for 30 McDonnell F2H3 Banshee fighters has been placed on behalf of the Royal Canadian Navy. The American planes will be used on the new carrier Bonaventure and will replace the RCN's Hawker Sea Fury aircraft.

MANUFACTURING

FRANCE: SNCA du Nord is to receive orders for an additional 60 Nord 2501 Noratlas transports. Company's Sartrouville plant is to be leased to Radio Industrie.

Plans for the construction of the Hurel Dubois HD 45 twin-jet transport may be shelved as a result of a reported French government decision to permit only one jet transport prototype to be built—the SNCA du Sud-Est SE 210 Caravelle.

Disappearance of the veteran Breguet company from the manufacturing field will result if the firm's Anglet, Toulouse, and Villacoublay plants are closed, as is indicated. The company would not drop design work, however.

JAPAN: Beech Aircraft Corp. has officially announced the Fuji Heavy Industries Inc., Tokyo, is to build Beechcraft Model 45 Mentor trainers under license. Production will probably start next spring and six to seven aircraft will be delivered monthly to the Japanese security forces.

Toyo Aircraft Manufacturing Co. is in receivership and reportedly is being taken over by interests associated with the Mitsubishi group.

AIRLINES

AUSTRALIA: Trans-Australia Airlines has chartered a Douglas DC-6 from KLM Royal Dutch Airlines for a few months following competitor Australian National Airways' purchase of two aircraft of this type from National Airlines. Both carriers will introduce DC-6 service this month.

CANADA: Trans-Canada Air Lines will use some of its eight Lockheed Super Constellations on domestic services starting in the fall. The 63-seat planes will operate two daily first-class flights between Montreal and Vancouver as well as flying TCA overseas routes.

BRITAIN: Airwork Ltd. plans to start its trans-Atlantic all-cargo service with two weekly services from London to New York (one via Montreal) using Handley Page Hermes. Latter it will operate two Douglas DC-6C's. With the Hermes the independent expects to sustain an annual loss of \$117,000, whereas with the DC-6C's it would make a profit of \$650,000 on the operation.

JAPAN: Japan Air Lines will inaugurate trans-Pacific service in February with 38-passenger first class DC-6B's. In April it will convert the aircraft into combination class layouts for 12 first class and 47 tourist passengers.

BELGIUM: SABENA Belgian Airlines is buying a fourth Sikorsky S-55 helicopter. By the middle of last month it had carried over 3000 passengers in its rotorcraft; 39% had never flown before.

SCANDINAVIA: Scandinavian Airlines System is buying two more Saab Scandia twin-engine transports. These are to be supplied from Fokker's license production in the Netherlands. SAS is selling three more DC-3's, reducing its fleet of this aircraft to nine, and also plans to sell its remaining seven DC-4's.



Spain's first postwar production transports are pictured here. They are the first four CASA 201 Alcotan aircraft off the production line of the Construcciones Aeronauticas S. A. plant at Getafe.

U.S. Domestic Airline Traffic for September, 1953

AIRLINES	REVENUE PASSENGERS	REVENUE PASSENGER MILES	AVAILABLE SEAT MILES	PASSENGER LOAD FACTOR	MAIL TON-MILES	EXPRESS TON-MILES	FREIGHT TON-MILES	TOTAL TON-MILES	REV. TRAFFIC	AVAILABLE TON-MILES	% AVAILABLE TON-MILES	REVENUE PLANE-MILES	SCHEDULED MILES	% SCHEDULED MILES COMPLETED
American	531,246	299,862,000	441,972,000	67.5%	1,362,212	867,764	4,707,530	35,600,800	59,052,241	60,29	9,125,307	9,104,165	99.59	
Braniff	108,230	41,634,000	75,178,000	55.38	144,074	95,016	213,508	4,436,139	7,836,323	56.61	1,921,288	1,916,140	98.65	
Capital	203,817	64,980,000	110,023,000	59.06	179,470	221,145	329,689	6,939,046	14,914,336	46.53	2,585,377	2,523,722	98.87	
Caribbean	7,908	64,900	1,301,000	49.88	862	• • •	1,294	61,192	137,366	44.55	53,222	52,310	96.04	
Colonial	38,012	9,352,000	15,769,000	59.31	11,869	8,348	22,481	912,404	1,709,313	53.38	442,011	391,442	99.40	
Continental	33,112	13,559,000	25,968,000	52.21	46,250	17,568	68,932	1,433,447	3,269,783	43.84	678,912	654,486	99.98	
Delta-CAB	136,852	53,107,000	90,564,000	64.66	230,850	207,725	511,594	6,042,452	10,831,206	55.78	2,331,651	2,339,059	99.03	
Eastern	367,615	165,813,000	299,556,000	55.35	450,779	348,665	563,257	18,151,085	39,457,463	46.00	5,512,817	5,476,317	99.26	
Hawaiian	32,450	4,260,000	7,869,000	54.14	2,462	• • •	108,280	470,400	1,086,396	43.30	256,632	203,682	99.04	
National	56,022	37,248,000	62,465,000	59.63	116,693	50,413	476,362	4,423,200	7,454,074	59.10	1,302,575	1,300,885	97.91	
Northwest	49,418	9,901,000	17,857,000	55.45	11,959	12,999	21,580	94,528	1,758,589	53.60	594,564	582,618	95.73	
Pacific	100,280	71,279,000	110,346,000	64.60	260,003	164,782	325,665	7,603,117	12,645,672	60.16	1,833,727	1,821,694	99.39	
Trans. Pac.	13,627	1,697,000	3,619,000	46.89	1,450	106	7,438	1,62,832	299,073	47.76	129,266	105,524	98.71	
Tok	271,747	220,488,000	297,972,000	74.00	1,047,673	629,723	1,559,978	3,330,103	36,232,676	67.15	5,702,261	5,851,933	97.00	
United	371,742	247,876,000	339,725,000	72.96	1,415,933	837,899	2,336,975	28,359,823	48,996,866	57.88	7,182,217	7,218,331	98.30	
Western	72,829	32,543,000	52,953,000	61,46	122,729	62,114	110,942	3,404,385	5,9,2,182	57.29	1,217,652	1,223,107	99.17	
TOTALS	2,394,907	1,274,248,000	1,953,137,000	65.24	5,405,268	3,524,267	11,365,505	14,257,953	251,655,560	56.93	40,871,478	40,765,215	98.69	
* Braniff's figures do not include operations of local service route 106 operated by Braniff as result of Braniff-MCA merger.														
** Mail ton-mile figures include air parcel post.														
NOTE: Above figures include both scheduled and non-scheduled operations.														

U.S. International Airline Traffic for August, 1953

AIRLINES	REVENUE PASSENGERS	REVENUE PASSENGER MILES	AVAILABLE SEAT MILES	PASSENGER LOAD FACTOR	U. S. MAIL TON-MILES*	FOREIGN MAIL TON-MILES	EXPRESS TON-MILES	FREIGHT TON-MILES	TOTAL TON-MILES	REV. TRAFFIC	AVAILABLE TON-MILES	% AVAILABLE TON-MILES	REVENUE PLANE-MILES	SCHEDULED MILES	% SCHEDULED MILES COMPLETED
American	9,200	7,148,000	10,726,000	66.60	14,869	4,817	498	197,788	968,657	1,599,035	60.58	196,009	192,231	100.00	
Braniff	2,845	6,920,000	15,026,000	66.05	69,887	8,427	• • •	98,743	96,937	2,073,520	45.67	339,983	360,085	94.42	
Colonial	5,642	4,402,000	5,585,000	78.82	1,321	629	• • •	4,487	470,626	831,883	56.57	102,690	49,861	97.84	
Delta-CAB	3,521	3,942,000	7,141,000	59.20	11,633	1,046	• • •	93,252	512,746	989,050	51.82	153,638	161,472	95.15	
Eastern	16,395	24,96,000	33,996,000	73.38	47,375	• • •	2,365	45,165	2,664,313	4,731,787	56.31	555,929	336,897	100.00	
National	10,735	4,502,000	8,707,000	51.71	4,404	2,516	16,836	23,691	492,557	1,166,076	42.98	145,768	144,646	99.29	
Northwest	8,999	14,850,000	24,633,000	60.28	107,935	25,716	16,836	651,389	3,287,904	3,579,946	66.70	933,389	580,073	98.71	
Panama	10,568	11,640,000	22,060,000	52.77	29,839	30,520	• • •	286,028	1,632,853	2,923,182	55.86	510,309	491,858	98.12	
PAC	77,363	78,056,000	115,738,000	67.44	236,535	59,722	• • •	1,899,850	9,423,036	14,189,294	66.41	2,333,710	2,003,265	95.98	
Latin Amer.	69,458	76,967,000	121,296,000	63.45	635,747	154,905	• • •	923,718	9,854,551	15,476,324	63.68	1,970,203	1,896,251	98.52	
Pacific	14,779	46,145,000	62,533,000	73.79	383,574	99,896	• • •	591,115	9,429,874	9,516,746	62.52	1,122,369	1,119,829	99.77	
Alaska	8,922	8,897,000	16,182,000	54.98	31,633	• • •	• • •	441,933	1,386,549	2,401,738	57.73	366,180	304,482	100.00	
TWA	23,413	58,250,000	79,625,000	73.16	394,939	127,259	• • •	628,451	7,246,570	9,754,714	74.29	1,667,679	1,700,659	90.83	
United	6,238	15,465,000	19,340,000	79.96	40,610	• • •	• • •	40,812	1,618,965	2,280,993	72.29	349,441	352,494	96.19	
TOTALS	266,778	362,130,000	542,588,000	66.74	2,010,301	512,937	19,679	5,888,671	45,586,138	71,494,288	63.76	10,405,477	9,696,103	97.60	
* U.S. mail ton-mile figures include air parcel post.															
NOTE: 1. Above figures include both scheduled and non-scheduled operations. 2. Data in above tabulations were compiled by American Aviation Publications from reports filed by the airlines with the Civil Aeronautics Board. Figures for American Airlines include that carrier's service to Mexico but not to Canada; for Braniff to South America; for Colonial to Bermuda; for Pan American to Puerto Rico; to Havana; for TWA to Mexico; and United to Honolulu. Operations of U.S. carriers in Canada are included in domestic reports to CAB, in accordance with CAB filing procedures.															

U.S. Local Service Airline Traffic for August, 1953

AIRLINES	REVENUE PASSENGERS	REVENUE PASSENGER MILES	AVAILABLE SEAT MILES	PASSENGER LOAD FACTOR	MAIL TON-MILES	EXPRESS TON-MILES	FREIGHT TON-MILES	TOTAL TON-MILES	REV. TRAFFIC	AVAILABLE TON-MILES	% AVAILABLE TON-MILES	REVENUE PLANE MILES	SCHEDULED MILES	% SCHEDULED MILES COMPLETED	
Allegheny	24,176	3,607,000	6,746,000	53.46	5,551	10,543	• • •	360,150	771,022	46.71	321,259	320,195	99.05		
Braniff	5,763	1,304,000	3,447,000	37.83	1,912	1,154	2,931	130,827	340,256	38,45	143,597	145,886	97.96		
Central	5,385	1,049,000	2,032,000	51.62	2,072	1,997	1,703	105,802	203,198	52.07	34,666	80,786	99.98		
Frontier	3,112	485,000	2,961,000	16,38	2,865	978	2,301	52,428	374,306	14.01	155,961	155,961	100.00		
Hawaiian	12,836	3,305,000	7,775,000	42.51	7,898	5,206	38,859	367,330	744,726	49.32	374,477	370,140	99.74		
Lake Central	6,318	930,000	3,761,000	24.73	2,260	6,114	7,092	92,619	405,040	22,87	166,767	170,159	99.18		
Mohawk	16,517	2,822,000	5,133,000	54.52	2,473	5,266	7,283	268,497	604,312	44.43	228,686	251,416	97.78		
N.W. Central	24,359	4,497,000	8,945,000	50.27	9,444	15,575	• • •	483,220	1,022,036	47.28	425,934	441,991	96.28		
Clark	12,077	1,938,000	6,759,000	28.67	3,176	5,317	• • •	189,751	666,445	28.47	270,764	269,886	99.20		
Piedmont	26,770	5,599,000	11,228,000	49,87	8,900	8,769	15,311	567,070	1,281,902	44.17	534,999	537,159	99.21		
Pioneer	10,538	3,006,000	6,843,000	43.93	7,999	3,178	11,803	310,479	723,832	42.90	258,196	260,753	99.02		
Southern	10,034	1,747,000	5,560,000	31,42	5,614	5,614	• • •	7,283	602,411	29.85	265,060	265,120	99.75		
Southwest	19,815	4,156,000	6,893,000	60.25	6,300	3,493	8,222	414,144	757,206	54.69	267,136	221,561	99.19		
Trans-Texas	9,423	1,952,000	7,936,000	24.62	6,934	3,457	8,616	205,680	906,965	22.68	377,902	378,279	99.82		
West Coast	17,944	3,115,000	6,633,000	46.96	4,041	2,292	3,960	291,558	682,099	42.75	315,746	313,317	99.37		
TOTALS	205,057	39,532,000	92,757,000	42.63	77,209	80,622	98,798	4,019,398	10,087,716	39.84	4,212,910	4,182,709	98.93		
* Figures cover operations of local service route 106 operated by Braniff Airways as result of Braniff-MCA merger.															
NOTE: E.W. Wiggins Airways terminated operations as of August 1, 1953, per CAB Order E 7534.															
* Above figures include both scheduled and non-scheduled operations.															

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En Route

WAYNE W. PARRISH



Seeing Switzerland. To me one of the finest relaxations in this world is driving your own car in Europe, assuming, of course, that you don't stick to the busy arterial highways and big cities.

Having arrived in Zurich four days early for the dedication of the Kloten Airport terminal late in August, I decided to see some new parts of Switzerland. The first order of business was to hire a car from a reputable agency and I signed up with Max R. Spycher, who owns Spycher's Swissways. All he had available at the moment was an old model Opel, made by the German company of General Motors. The new Opels are quite good. Mine was okey for the purpose but I wouldn't have wanted to drive across the U. S. in it. Spycher also has American cars for hire.

So I got myself some maps and a very useful book called "Motoring Through Europe" and started out. It's amazing how much of Switzerland you can see in a single day. From Zurich I drove north through the industrial town of Winterthur to see the Rhine Falls, said to be the largest falls in Europe. They are in the extreme northwestern part of the country near Schaffhausen and are quite a tourist attraction.

Just to show I was a tourist I lunched on an oversized Swiss frankfurter (mighty good but pretty strong on the garlic), a bottle of milk chocolate, and a candy bar.



All But Konstanz. From there I drove along the southern side of the Rhine River through one picturesque village after another. I can especially recommend the village of Stein, on the north side of the Rhine, as being like a stage setting. The day was fine, the

traffic light, and I had a gay time looking at the scenery. This is not an area of mountains, but the countryside is most pleasant.

I thought I'd take a look at the city of Konstanz, where the Rhine breaks out into Lake Konstanz (or Constance in English) and was rolling merrily along until suddenly I saw a customs barrier a few hundred feet ahead. I slammed on the brakes, since I had no international ticket for my car and no desire to go outside of Switzerland. For the first time I realized that the city of Konstanz is actually in Germany, although it is on the Swiss side of the lake. When the Konstanz Germans go anywhere in their own country they have to cross to Germany proper by ferry.

So I skirted the customs barrier and Konstanz and went on down the southern shore of the lake as far as Rorschach and then turned back toward Zurich through St. Gallen, a lace and industrial center and via a zig-zag network of secondary routes through utterly fascinating rolling farm country.

I got back to the Dolder Grand Hotel overlooking Zurich just at dusk. I had been driving about seven hours, at most, and had seen a lot of Switzerland which is not on the major tourist routes.

Liechtenstein at Last. Next morning I headed for a goal of some 25 years' standing. This was the tiny principality of Liechtenstein, which is only about three hours driving from Zurich. I drove along the northern shore of the Lake of Zurich to the very picturesque town of Rapperswil, then over some twisting but extremely attractive roads to Appenzell, then Altstatten and then on up the Rhine to Buchs for the turnoff to Liechtenstein.

Here is the smallest state of Europe, bounded on the east by Austria and on the west by Switzerland. It's only about 25 or 30 miles long and a half-dozen miles wide, but it has its own post office (all tourists stop there to buy up the stamp issues) and a capital town of Vaduz.

Total population of the country is about 14,000. It's a constitutional monarchy on a democratic basis. Prince Franz Joseph shares his executive power with the people. I stopped for lunch in Vaduz at the Restaurant Real; fair enough.

I had always heard that Liechtenstein was a picturesque little country.

but I thought that that was probably propaganda. Harken to my words of wisdom, dear readers. Believe me, on a nice clear summer's day you'll never find a more challengingly beautiful area than the valley in which Liechtenstein rests. The castles in the region add to the picture-postcard views, except that no photograph could transmit the beauties of the haze, the surrounding mountains, the neat farms, the interesting architecture, the winding roads and all the rest. It was super.

Klausen Pass. By noon I had already covered what seemed to be a two-day trip . . . So I crowded in a lot more on the afternoon's drive back to Zurich. I went out the southern end of Liechtenstein to Sargans and then along the southern shore of the Wallensee and turned south to Glarus and then climbed up and over the Klausen Pass and down to Altdorf.



What a trip! It was the kind of drive which makes you whistle every so often at the views. Not many times in my life have I seen so much absolutely wonderful scenery on one trip. My Opel chugged right along even above the timber line among the snow and it must have taken me several hours to cover the Klausen route.

By that time it was getting late in the afternoon, so I wasted no time returning via Brunnen, Schwyz and over some mountains via secondary roads to the southern shore of the Lake of Zurich. It was dark by the time I got to the city, and I arrived at the hotel just in time to keep my dinner date with Alfie Pigg, BEA's manager for Zurich.

Driving is a real pleasure in Switzerland, as long as you can keep away from one or two main traffic arteries (The Zurich-Lucerne-Altdorf-Andermatt road, for example). There is no speed limit, except inside of towns, the roads are quite well marked (except the secondaries, and I wish Switzerland would put some numbers on those) and every road I was on was either in good or excellent condition.

There are plenty of gas stations and plenty of places to stop and eat and I know of no place where you can get so many changes and variations of scenery in such short distances. Take your car or hire one and see the country. If the weather is bad, stay in some nice hotel until it breaks. Driving in Switzerland is no fun in bad weather. • • •

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If this man were free to speak...

Much of his thinking is classified as *Security Information*. Much of his mind is pledged to silence, for the love of his country and the future of our world . . . But this much he *can* tell:

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2. YOU'D HAVE THE CAR STRIPPED to the frame. Parts would then move on a "production line" to specialists . . . engine to the Engine Overhaul shop for disassembly . . . instruments to the Radio-Electric department and so on.

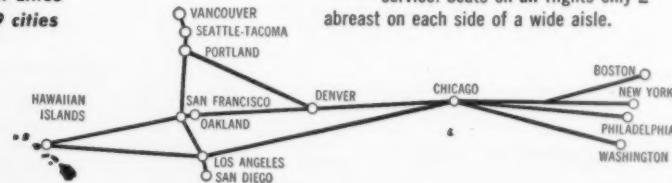


3. YOU'D HAVE THE PARTS carefully inspected, using scientific equipment including "magic eyes" which can detect metal "fatigue." You'd have a part replaced if it showed even the *slightest* wear. After reassembly you'd have the car tested for hours, just as Mainliners are flight-tested. In addition to reconditioning, the average DC-6 Mainliner has over \$20,000 worth of the latest improvements added so it is returned to service *better* than new.



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News at Deadline

Hobbs Wins 1952 Collier Trophy for J57

Winner of the Collier Trophy for outstanding achievement in aviation during 1952 is Leonard S. Hobbs, president of engineering for United Aircraft Corp. Hobbs received the award, scheduled for presentation at a Wright Day dinner on December 17, for his work in developing the J57 turbojet engine, described as the most powerful aircraft powerplant in the world.

"No one man can claim credit for a project such as this," says Hobbs. "It took the combined efforts of a great many people: Andy Wilgoos, who headed up the early research work; Wright Parkins, P&W's engineering manager after Andy's death; and 1500 Pratt & Whitney engineers."

The Collier Trophy was donated in 1911 by the late Robert J. Collier, editor and son of the founder of *Colliers* magazine.

Continental, Pioneer Ask Merger Approval

Continental Air Lines and Pioneer Air Lines have applied to CAB for approval of a December 10, 1953, agreement under which Continental would purchase assets of Pioneer and acquire the local service line's 1981-mile system. Total purchase price will approximate \$15 million.

In addition to CAB approval, the deal is also subject to (1) approval of stockholders of both firms by March 1, 1954 and (2) approval of the Chase National Bank of New York and the First National Bank in Dallas.

Continental will not acquire the nine Martin 2-0-2 aircraft owned by Pioneer, nor will it assume liability for the bank debt incurred when the 20-2's were purchased. That debt, on loans from Chase and the Dallas bank, originally totaled \$2.3 million.

Total purchase price to be paid by Continental, as described in the agreement, "shall be Pioneer's book value of the assets purchased by Continental . . . after deduction of all customary reserves, including depreciation plus 65,000 shares of Continental's capital stock at an agreed value of \$6 per share." Value of such stock would total \$390,000. An exhibit attached to the agreement lists Pioneer's "assets to be purchased" as of October 31, 1953 as totaling \$1,076,790.71.

Robert F. Six, Continental president, will continue in that capacity if the acquisition is accomplished. The enlarged firm would increase its board of directors from 11 to 13, with the additional seats going to W. F. Long and Robert J. Smith, board chairman and president, respectively, of Pioneer.

Original agreement is for one year from December 10, 1953. It would terminate if CAB has not rendered a decision by that date, except that extensions may be voted by "the board of directors of either party."

Strikes and Threats Ebb in Industry

The aircraft and airline industries were without a strike for the first time in more than seven weeks as one major walkout (against North American Aviation) ended, a threatened one (against Piedmont Airlines) was averted, and a new contract signed, and contract negotiations continued peacefully at several other aircraft plants:

• North American Aviation's strike, which was begun by 33,000 CIO-Auto-workers on October 22, ended as UAW negotiators accepted the four per cent offered by the company in the first place. About 50% of the workers at Los Angeles, Fresno, and Columbus had returned to their jobs before the union accepted the company's original proposal with only minor changes.

• Pratt & Whitney Aircraft AFL-Machinist members working at East Hartford, Southington, Meriden, and Portland, Conn., turned down a company offer of a nine-cent blanket wage increase. The contract ended December 4 and IAM members authorized a strike call by union leaders, but no walkout was expected.

• Lockheed Aircraft signed a contract with its Machinists at Burbank patterned after the agreement accepted by IAM members at Douglas-El Segundo, and Douglas-Santa Monica followed the same pattern. Negotiations between the IAM and Consolidated Vultee-San Diego continued.

• At Piedmont Airlines, where a strike call by members of the AFL-Air Line Pilots Association for December 12 was called off at the last minute by intervention of two National Mediation Board members, bargainers agreed on a new contract. Piedmont president T. H. Davis said the contract's pay provisions were basically what the company had offered but declared the vacation time was increased from 14 to 15 days a year.

Canadair to Build Britannias for RCAF

An order from the Royal Canadian Air Force to Canadair Ltd. for 40 modified Bristol Britannias is expected shortly, according to AMERICAN AVIATION's Canadian correspondent. Canadair has already received authorization from the Canadian government to go ahead with engineering design study, development work, and construction of a prototype.

Canadair had previously proposed a Canadian-designed plane as an alternative to the revised Britannia. Critics of the present plan predict that payments to Bristol for licensing and royalties will probably total more than a Canadian design would have cost. Lack of standardization in engineering practices between Britain and Canada may also introduce difficulties, according to Canadian observers.

USAF Production Now Leveling Off: Lewis

Production of equipment with which to build the Air Force is leveling off, according to Roger Lewis, AF assistant secretary.

"It was planned in 1950 that we would rearm quickly, and our schedules and programs were set as close to mobilization build-up rates as possible, with the expectation that once the inventory was full we would promptly return to something between our 1949 rate of production and our peak," Lewis told a Town Hall Meeting at the Los Angeles Biltmore.

Land Resigns as President of ATA

Emory S. Land has resigned as president of the Air Transport Association, effective December 31.

Land's resignation concludes eight years of service in that capacity. He had originally assumed the leadership of ATA for a three-year period, but he was twice prevailed upon by the board of directors to remain. A committee was set up 18 months ago for the purpose of selecting a new president, and it is now reported to have come to an agreement upon a replacement.

Land indicated that he would also resign as president and board chairman of Air Cargo, Inc., and Aeronautical Radio, Inc., respectively.

Adams Predicts Rise In Cargo and Coach

Optimism regarding aviation's future marked a speech by CAB Member Joseph P. Adams in Indianapolis.

Adams foresaw a future in which revenues from air cargo would surpass those from passengers, and in which air coach service would have greater volume than first class travel.

Other developments expected by Adams:

- Wing design incorporating boundary layer control, making it possible for supersonic aircraft to increase fuel economy and lower stalling speeds;

- A doubling of the passenger total in the next decade, bringing the annual level to more than 60 million, or twice the 1952 figure.

U. S. International Profit Hits Peak

Net operating revenue was up over \$9.5 million for U. S. scheduled international and overseas airlines during the third quarter of 1953. The figure represented the highest single quarter's net since records have been kept in the present form.

Total operating revenue increased 10.5% over the similar quarter of 1952, while expenses fell 0.04%.

North American to Fly DC-6's in April

North American Aircoach Systems plans to start operations with Douglas DC-6's in April. Two DC-6B's ordered by the non-scheduled carrier earlier this year were not scheduled for delivery until "late in 1954." It is not known whether the aircraft that will be put into service in April are these or others.

American Protests Mail Exemption Decision

American Airlines has urged the CAB to reconsider a decision in which it declared that it has the power to issue exemptions for non-mail carriers to transport mail at compensatory rates (see page 16). American also requested "full evidentiary hearings" on the applications.

The Board's power to grant exemptions, AA said, is "a power to relieve air carriers of burdensome statutory requirements. . . . But this does not mean that with such an exemption the carrier is automatically entitled to carry persons, property, or mail."

Strategic Approach Faulty, Says Smith

A reduction in the military budget can be achieved by sorting out the roles and missions of the military services, C. R. Smith, American Airlines president, said in a recent speech before the Tulsa, Okla., Chamber of Commerce. He estimated it could reduce the military establishment from 3,500,000 to 2,500,000 men and lower the overall military budget by \$10 billion.

Present forces fail to reflect atomic weapons advances and the coincidental development of long-range aircraft able to deliver them, Smith said. He noted that "an increasing number of thoughtful men are swinging to the belief that there is something wrong with our prevailing approach to strategy, with its emphasis on surface weapons."

Radford Sees Air Power Complementary Weapon

Noting that the "best defense plans and programs will come about through evolution," Adm. Arthur W. Radford, Joint Chiefs of Staff chairman, said recently that airpower "must be complemented with other forces for an indeterminate period in the future."

In one of his initial addresses since assuming the top military post, Radford told the American Ordnance Association airpower is a "primary requirement" in present day military planning and "there is no question but that the U. S. will maintain national airpower that is superior to that of any other nation."

Kyes Cites Savings

Deputy Defense Secretary Roger M. Kyes, in an address before the Adcraft Club at Detroit, accounted for nearly a quarter of a billion dollars which the AF is saving in its overall economy efforts. He said the AF is "doing so well" that it will be able "to man 120 wings with 90,000 fewer people than the original estimate."

F-86K Parts to Italy

The first batch of parts for the F-86K have been shipped to Italy under the NATO off-shore procurement program by North American Aviation. The parts will be assembled by Fiat under license. Fifty of the interceptors will be produced from such parts by the Italian manufacturer. Modified fire control and armament (20 mm cannon instead of rockets) distinguish the Italian version of the Sabre from the all-weather F-86D.

CAB Extends Military Charter Exemptions

Special exemptions under which airlines offer unlimited service for military contract operations have been extended for one year by the CAB. New expiration date is December 1, 1954.

Defense Secretary Wilson had written the Board that a military emergency no longer existed, but that Defense could foresee economies if the exemptions were extended.

Operating Ratio Urged As Rate Criterion

The proper criterion for rate-making in the airline business is operating ratio, William J. Hogan, vice president and treasurer of American Airlines, has told members of the Los Angeles Stock Exchange.

This approach, which carriers can be expected to urge upon CAB, has the advantage of "eliminating endless controversy and litigation as to what the allowable investment should be in arriving at a rate base," he said.

A return on invested capital for a utility yields a sizeable profit in relation to gross business, but a similar return to an airline does not, Hogan stated, adding that "moderate fluctuations in revenue and expense do not have the relative impact on profits of a utility as they do on those of the airline. Yet airline revenues are much more subject to fluctuations . . . If revenue and expense are calculated so as to yield a reasonable operating ratio (and we think 10% margin after taxes is reasonable), then minor fluctuations . . . will not have such disastrous effects on the resulting profit."

Space Travel Possible By 1969: Sikorsky

Igor Sikorsky envisions 40-50 passenger helicopters which will cut city-to-airport travel time by one-third to one-half and unload passengers directly into 90-100 seat jet transports at the end of the airport runway. The forecast was made by the engineering manager of Sikorsky Aircraft Division of United Aircraft Corp. while speaking before a luncheon meeting of the ASME, IAS, and SAE in New York.

Sikorsky also forecast piloted flights at 2500 mph speeds within five years, and found space travel by 1969 not beyond the realm of possibility.

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